SONY®

Video Camera Recorder 8

CCD-F55

Operating Instructions

Before operating the unit, please read this manual thoroughly and retain it for future reference.

Video 8 Handycam

© 1990 by Sony Corporation

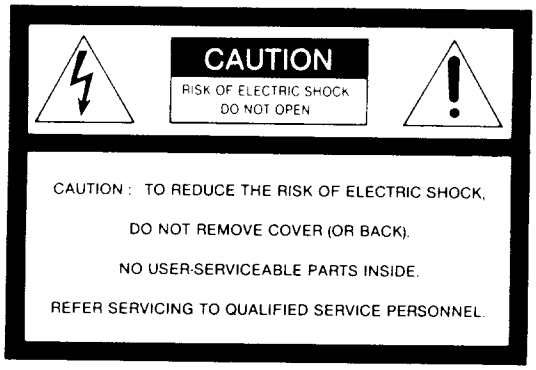
Owner's Record

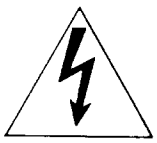
The model and serial numbers are located on the bottom. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. CCD-F55 Serial No. _____

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION : TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

INFORMATION FOR THE CUSTOMERS IN THE U.S.A.

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna
Relocate the equipment with respect to the receiver
Move the equipment away from the receiver
Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems".

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

For the customers in Canada

This apparatus complies with the Class B limits for radio noise emissions set out in Radio Interference Regulations.

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Introduction

How the Manual is Organized

The first section of the manual explains the preliminary steps necessary to prepare for shooting and playing back.

Other sections include shooting procedures that show how to use the features and functions of your camcorder. If you are a beginner, start with "Recording a picture using automatic adjustments". If you are very familiar with camcorders, try to shoot your picture with manual adjustments as well as automatic adjustment. If you want to record right away, see pages 11, 22, and 28.

The manual also includes how to play back a picture on a TV, how to edit your original 8mm tape onto another video tape, and how to record a picture from another video tape or TV.

If you have any problems during operation, see the "Trouble check" section.

How this Manual Works

Use the information below to help you follow the instructions in this manual.

- Controls and settings on the camcorder are shown in capital letters:
  ex. Set POWER to CAMERA.
- The letter in an illustration corresponds to the letter in the text.
  ex. (A-1) or (B)
- The step number in an illustration correspond to the step number in the text.
- Notes and cautions are enclosed with lines:

ex.

Note on battery life
Battery will not last as long in cold places.

Supplied Accessories

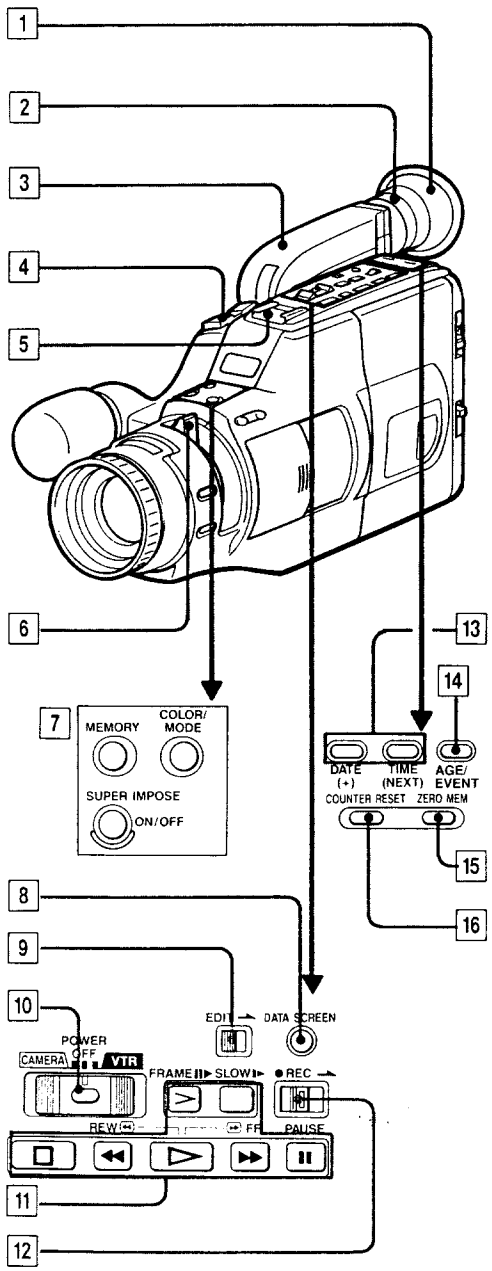
The camcorder is packed together with the following accessories. Check to see that everything is contained in the package.

- Remote Commander (1)
- Size AA (R6) battery for Remote Commander (2)
- Battery pack NP-66H (1)
- AC power adaptor AC-V60 (1)
- Lithium battery CR2025 (1)
- RFU adaptor RFU-90UC (1)
- Lens cap (1)*

*Attached to the camcorder

Identifying the Parts

(A-1)



For details on the use of each part, refer to the pages indicated in the circle.

(A-1)

1 **Eyecup**

2 **Viewfinder lens adjustment ring** ㉑

3 **Viewfinder (back cover)**
The picture being recorded or played back can be monitored in black and white in here. Also, indicators which shows caution and function mode appear in here.

4 **Power zoom button** ㉟

5 **Accessory shoe**
Attach a video light, external microphone, etc. (not supplied).

6 **Zoom lever** ㉟

7 **SUPERIMPOSE buttons** ㊴
MEMORY button
COLOR/MODE button
ON/OFF button

8 **DATA SCREEN button** ㊾

9 **EDIT switch** ㊷

10 **POWER switch**
CAMERA: for camera recording
VTR: for playing back or editing tapes
OFF: power off

11 **Tape transport buttons** ㊾ ㊿
>/II► (forward direction/frame-by-frame in forward direction)
I► (slow)
□ (stop)
◄◄ REW (rewind)
▷ (playback)
►► FF (fast forward)
II (pause)

12 ● **REC switch** ㊸

13 **DATE (+) and TIME (NEXT) buttons** ㊾

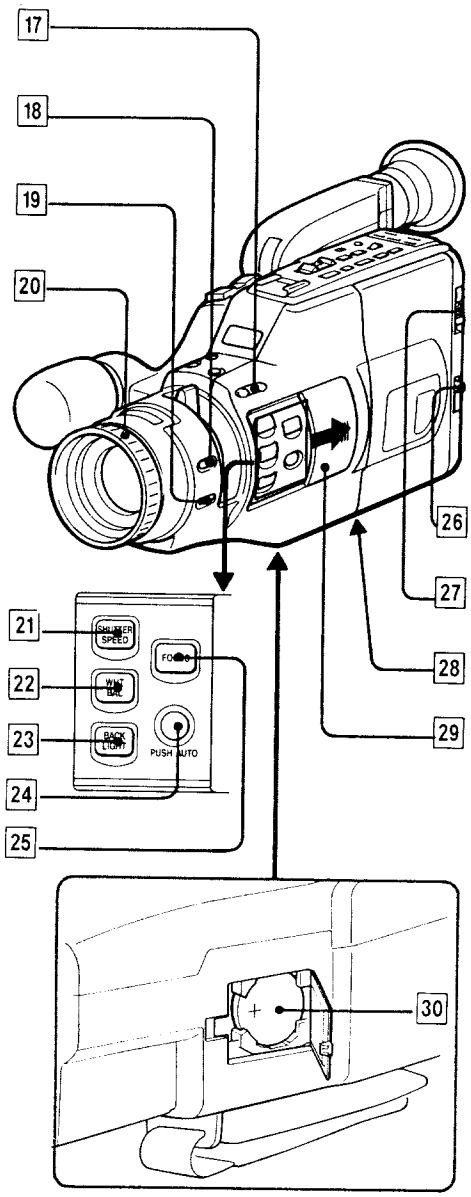
14 **AGE/EVENT button** ㊸

15 **ZERO MEM (zero memory) button** ㉖ ㊺

16 **COUNTER RESET button** ㉖ ㊺

Identifying the Parts

(A-2)



(A-2)

17 **EDITSEARCH (and ⟲ recording review) button** ㉕

18 **FADER button** ㉝

19 **MACRO AF (Auto-focusing in macro) button** ㉞
Press to record close-ups with automatic focusing.

20 **Lens hood (Focus ring)** ㉚

21 **SHUTTER SPEED button** ㉞

22 **WHT BAL (white balance) button** ㉛

23 **BACK LIGHT button** ㉞

24 **PUSH AUTO button** ㉚

25 **FOCUS button** ㉚

26 **BATT (battery eject) knob** ⑱

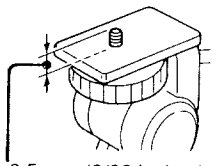
27 **EJECT (cassette eject) knob** ⑳

28 **Tripod receptacle (bottom)**

29 **AUTO LOCK cover** ㉘
To adjust the control such as focus, white balance, back light, or shutter speed manually, slide open this cover so that the buttons inside can be seen.

30 **Lithium battery compartment (bottom)** ⑱

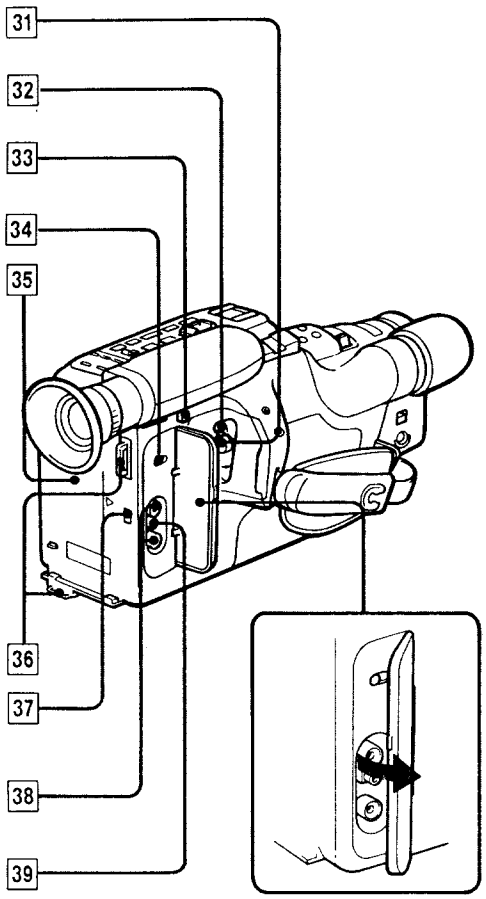
(A-3)



Less than 6.5 mm (9/32 inches)

Note on attaching a tripod (A-3)
When attaching a tripod other than Sony's, make sure that the length of the camera mounting screw is less than 6.5 mm (9/32 inches). Otherwise, the screw may damage the inner parts of the camcorder.

(A-4)



(A-4)

31 **START/STOP button** ㉒
Press to start and stop camera recording.

32 **STANDBY switch** ㉒
Slide up to set the camcorder to the recording standby mode.

33 **PUSH/SLIDE button (for adjusting the viewfinder)**
Slide the viewfinder to a suitable position.

34 **IN/OUT (video and audio input/output) selector** ㊸
Select the function of the VIDEO•AUDIO IN/OUT jacks, input or output.

35 **Battery mounting surface** ⑬

36 **Hooks for shoulder strap**

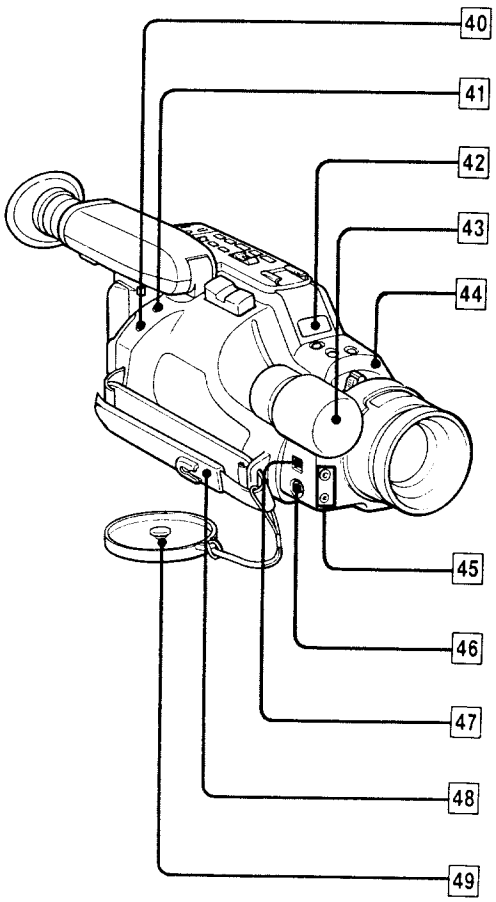
37 **R (REMOTE COMMANDER) ON/OFF switch** ⑨
Set to "ON" when using the supplied wireless Remote Commander. When you do not use the Commander, set to "OFF" to keep the unit from being operated incorrectly by another Commander etc.

38 **VIDEO•AUDIO IN/OUT (input/output) jacks (phono jacks)** ㊸

39 **RFU DC OUT (RFU adaptor DC output) jack (special minijack)** ㊼

Identifying the Parts

(A-5)



(A-5)

40 ⓟ (earphone) jack (minijack) ㉗

41 **REMOTE control connector (stereo mini-minijack)**
Connect a wired remote control unit or a editing controller, etc. here.

42 **Remote sensor** ⑨

43 **Built-in microphone (monaural)**

44 **Camera recording/battery lamp** ㉜
Lights up during recording and blinks when the battery becomes weak.

45 **MIC jack and DC OUT (microphone power output) jack (minijack)**
Connect an external microphone (not supplied).
The DC OUT jack supplies power to it. When connecting Sony "plug-in-power" microphones, use the MIC jack only.

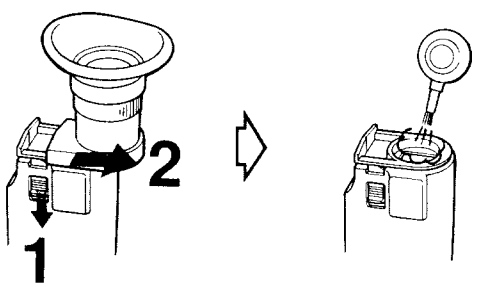
46 **REC START/STOP button (for low-position shooting)** ㉓
Use this button for easier low-position recording.

47 **BUILT-IN MIC (microphone) switch** ㉔
Set to "WIND" when recording in a strong wind.

48 **Grip strap** ⑪

49 **Lens cap** ⑪

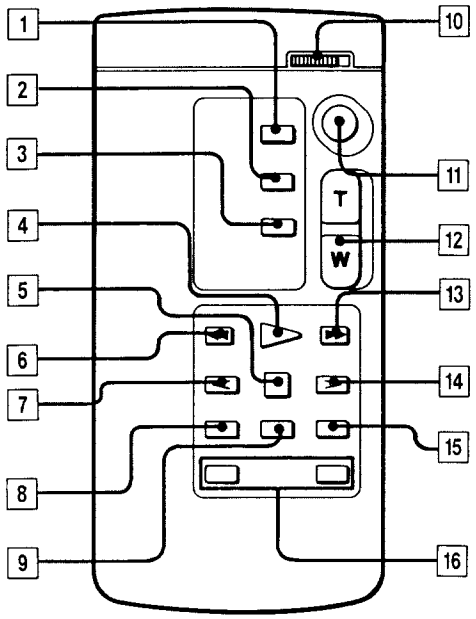
(A-6)



About ⓛ (LANC)
ⓛ stands for Local Application Control Bus System. The ⓛ connector is used for controlling the tape transport of video equipment and peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

To remove dust from inside the viewfinder (A-6)
Detach the eyecup as illustrated and clean the surface of the screen with a blower.

(A-7)



Wireless Remote Commander

You can record or play back a tape from a distance. The buttons on the Commander with the same name or mark as those on the camcorder have the same function.

When you use the Commander
Be sure to set the REMOTE COMMANDER ON/OFF switch on the camcorder to "ON", and then start operation of the camcorder, with the Commander pointing towards the remote sensor. (See page 10)

(A-7)

1 **DATA SCREEN button** 49

2 **COUNTER RESET button** 26 65

3 **ZERO MEM button** 26 55

4 ▷ **(playback) button** 49

5 □ **(stop) button** 49

6 ◀◀ **(rewind) button** 49

7 **</◀II (reverse direction/reverse frame) button** 50
Provided only on the Commander.

8 **II (pause) button** 50

9 **I▸ (slow) button** 50

10 **HOLD switch**
Slide in the direction of the arrow to prevent the buttons from being accidentally depressed.

11 **START/STOP button** 22
Press to start and stop camera recording.

12 **Power zoom button** 35

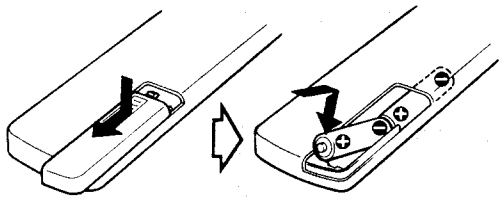
13 **▶▶ (fast forward) button** 49

14 **>/II▶ (forward direction/forward frame) button** 50

15 **X 2 button** 50
Provided only on the Commander.

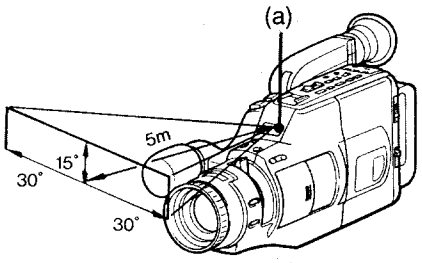
16 **Recording buttons** 53
Press both buttons simultaneously when recording from another equipment.

(A-8)



Inserting batteries
(A-8)
Insert two size AA (R6) batteries with polarity positioned correctly.

(A-9)

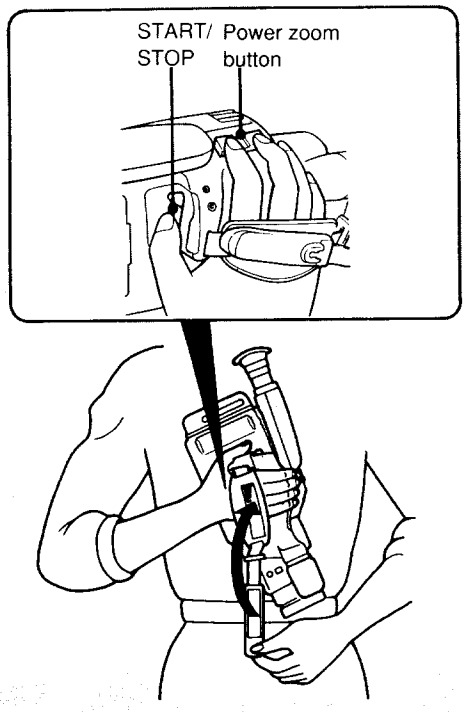


Remotely controllable area
(A-9)
Point the Commander towards the remote sensor (a).

Notes on batteries
With normal operation, batteries will last for about six months. However, if the commander will not be used for a long period, remove the batteries to avoid possible damage from battery leakage.

Preparing Your Camcorder

(B-1)



Before recording, prepare your camcorder following the steps below:

1 Connect a power source. → see page 12

2 Set the date and time. → see page 18

3 Insert a tape. → see page 20

4 Adjust the viewfinder lens.→ see page 21

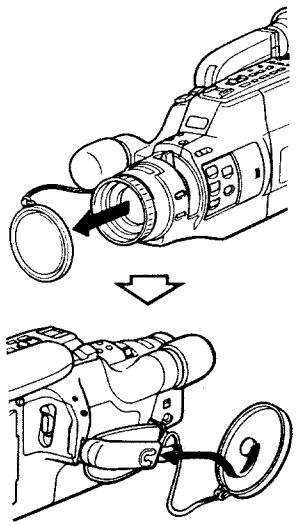
5 Adjust the length of the grip strap. **(B-1)**

6 Take off the lens cap and attach it to the grip strap. **(B-2)**

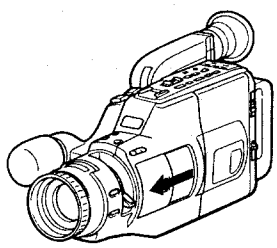
7 Close the AUTO LOCK cover. **(B-3)**
The focus, white balance, back light, and shutter speed will be adjusted automatically. If you want to adjust them manually, see page 28.

When you have completed these preparations, go to page 22.

(B-2)



(B-3)



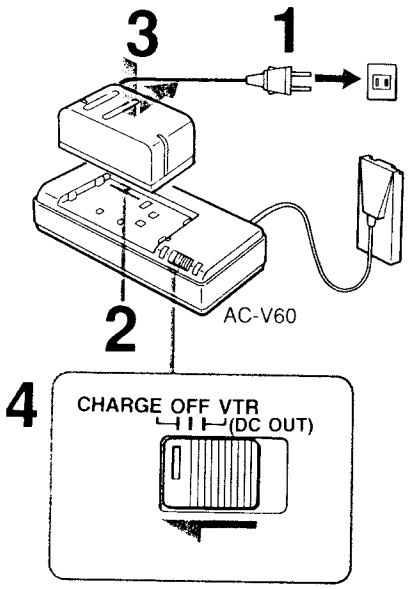
Connecting the Power Sources

First, Choose the Power Sources

Place	Power source	Accessory to be used
Outdoors	Battery pack	Battery pack NP-66H (supplied), NP-77H, NP-77, or NP-55
	Alkaline batteries	Battery case EBP-55
Indoors	House current	AC power adaptor AC-V60 (supplied), AC-V30, or AC-V55
In the car	12 V or 24 V car battery	DC pack DCP-55, or AC power adaptor AC-V55 and car battery cord DCC-16AW

Note on power sources
Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape. If disconnected, supply the power again immediately.

(C-1)



Using the Battery Pack

Step 1

Charge the battery pack. **(C-1)**

1 Connect the AC power adaptor to a wall outlet.

2 Align the right side of the battery pack with the line on the AC power adaptor.

3 Slide in the battery pack in the direction of the arrow.

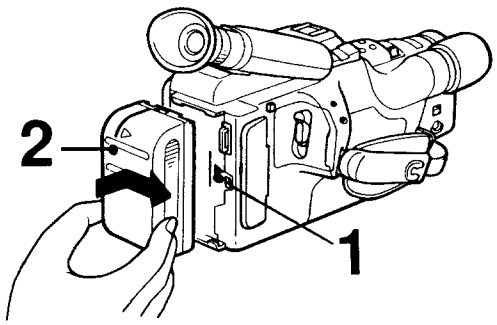
4 Set the CHARGE/VTR selector on the adaptor to CHARGE.

	NP-66H (supplied)	NP-77H	NP-77	NP-55
Required charging time	100	140	120	60

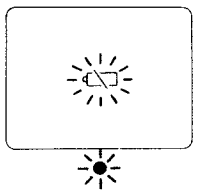
(approx. minutes using AC-V60)

See the instruction manual of the AC power adaptor for details.

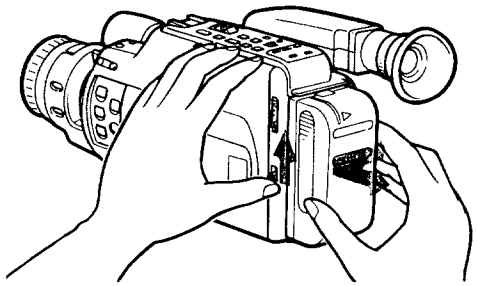
(C-2)



(C-3)



(C-4)



Step 2

Mount the battery pack on the camcorder. **(C-2)**

1 Align the right side of the battery pack with the line on the camcorder.

2 Slide in the battery pack to the right.

Notes
- Make sure the battery fits completely on the mounting surface of the camcorder.
  Imperfect fit may damage the projections on the camcorder.
- If your nose touches the battery pack, adjust the position of the viewfinder by sliding it while pressing PUSH SLIDE.

Battery life

A fully charged battery pack lasts for:

	NP-66H (supplied)	NP-77H	NP-77	NP-55
Battery life	85	110	90	50

(approx. minutes, continuous recording when used indoors)

When the battery becomes weak, the ⊏\⊐ indication and red lamp blink in the viewfinder. **(C-3)**
Also the camera recording/battery lamp on the camcorder blinks.
Replace the battery with a fully charged one.

To remove the battery pack (C-4)

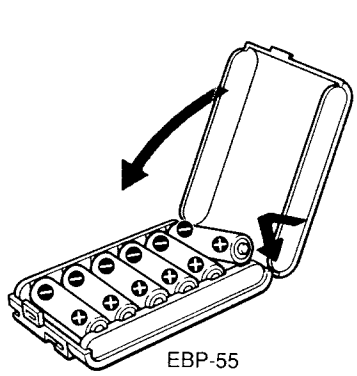
While sliding BATT up, slide out the battery pack to the left.

Other options for charging
- AC-V55 AC power adaptor:
  You can charge two battery packs simultaneously.
- BC-55, BC-77 portable battery charger:
  You can charge a battery pack on 100 – 240V AC.
- DC-V30 car battery charger:
  You can charge a battery pack by connecting the car battery charger to the cigarette lighter socket.

If you have an NP-4000

You can use it for long outdoor recording.

(C-5)



Using Alkaline Batteries

(C-5)

The EBP-55 battery case is required (not supplied).

1 Insert the size AA (R6) alkaline batteries into the battery case.

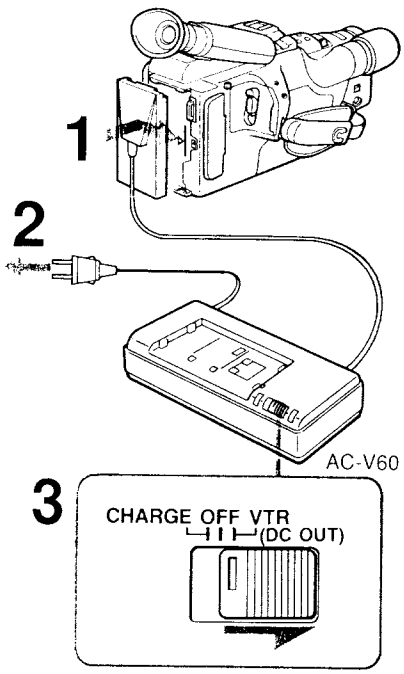
2 Attach the case in the same way as the battery pack.

Battery life (When using Sony alkaline batteries): approx. 45 minutes (continuous recording when used indoors)

To remove the battery case
Proceed in the same way as the battery pack. See page 13.

Notes on battery life
- Batteries will not last as long in cold places.
- No indication appears in the viewfinder to warn of a weak battery.

(C-6)



Using House Current

(C-6)

The supplied AC-V60 AC power adaptor is required.

1 Align the right side of the connecting plate with the line on the camcorder, and slide it in to the right.

2 Connect the AC power adaptor to a wall outlet.

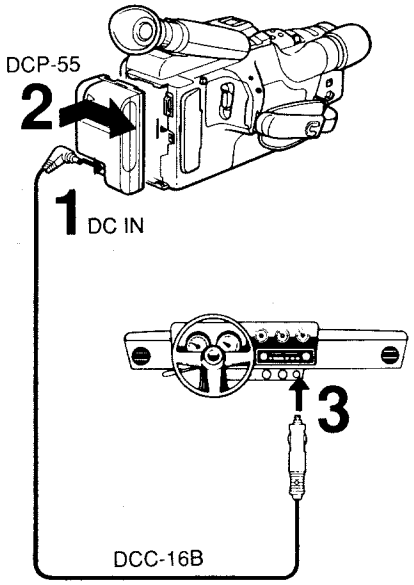
3 Set the CHARGE/VTR selector to VTR (DC OUT).

See the instruction manual of the AC power adaptor for details.

To remove the connecting plate
Proceed in the same way as the battery pack. See page 13.

The AC-V30 or AC-V55 AC power adaptor can also be used.

(C-7)



Connecting the Power Sources

Using Car Battery

(C-7)

The DCP-55 DC pack is required (not supplied).

1 Insert the DCC-16B car battery cord supplied with the DCP-55 DC pack into the DC IN jack on the DC pack.

2 Align the right side of the DC pack with the line on the camcorder, and slide it in to the right.

3 Connect the DCC-16B car battery cord to the cigarette lighter socket of a car (12 V or 24 V).

To remove the DC pack

Proceed in the same way as the battery pack.
See page 13.

Other options

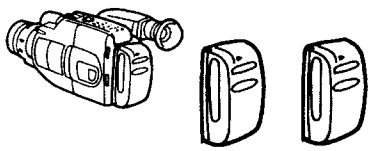
The AC-V55 AC power adaptor and the DCC-16AW car battery cord can also be used to operate this camcorder on a 12 V or 24 V car battery.

Connecting the Power Sources

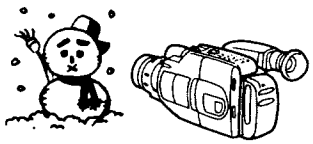
Using the Best of Battery Pack

How to prepare the rechargeable battery packs

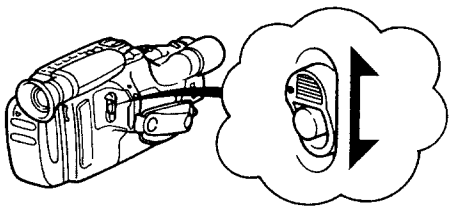
Have a sufficient battery pack power to perform 2 or 3 times as much recording than you have planned.
"Battery life" as indicated in the instruction manual or catalogue of the camcorder is measured by the continuous recording time of the camcorder, placed at a room temperature using a full-charged battery.



Battery life is shorter in a cold climate.
Battery efficiency is decreased and the battery will be used up more quickly.

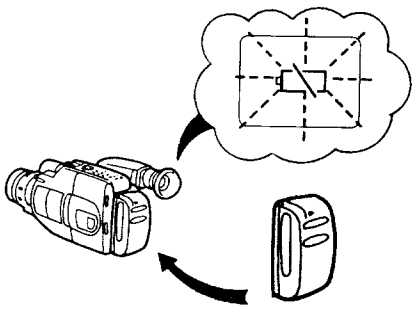


Turn the STANDBY switch of the camcorder off when not recording to save battery power.
A smooth recording can be made even if recording is stopped and started again.
While positioning the subject, selecting an angle, or looking through the viewfinder, the lens moves automatically and the battery is used. The battery is also used when a tape is inserted or removed.



When the rechargeable battery pack should be replaced

When the ⊏▽ mark in the viewfinder changes from slow blinking to rapid blinking while you are recording,
Turn off the power switch of the camcorder and replace the battery pack. Leave the tape in the camcorder in order to obtain a smooth recording after the battery pack is replaced.

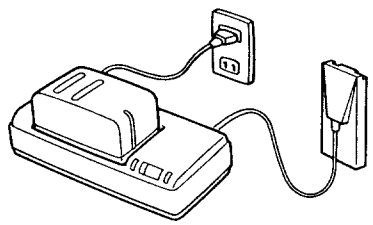


Notes on charging

Before using the battery pack, charge it sufficiently. A brand-new battery pack is not charged.

Recharge the battery pack when it is exhausted.

- If recording is completed before the ⌂ mark appears in the viewfinder, it is recommended that you remove the tape, set POWER to CAMERA, slide up STANDBY, and leave the camcorder until the ⌂ mark blinks rapidly.
- Repeated charging while some capacity remains causes a lowering of battery capacity. However, the original battery capacity can be recovered if you fully discharge and fully charge the battery again.



Recharge the battery pack before using.

If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged.
Charge it again but in this case the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

Keep the terminals clean

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.

When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact condition. Also wipe the + and – terminals with a soft cloth or paper.

Notes on the rechargeable battery pack

Why the battery pack heats up

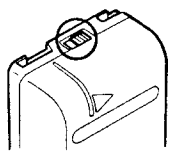
During charging or recording, the battery pack heats up. This means energy has been generated and a chemical change has occurred inside the battery pack, but this is not dangerous.

How to care for the battery pack

- Remove the battery pack from the camcorder after using it, and keep it in a cool place.
  When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is turned off. It causes overdischarging and will shorten battery life.
- The battery pack is always discharging even when it is not in use after charging. Thus, it is recommended you charge the battery before using.

How to use the switch on the battery pack

This switch is provided so that you can remember the charging condition. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up.



How many times can the battery pack be recharged

It can be fully charged and discharged about 500 times under normal temperatures.
If the ⌂ mark blinks rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Temperature during charging

Lower temperature require a longer charging time. Charging under temperatures ranging from 10°C to 30°C is recommended.

Setting the Date and Time

Inserting the Lithium Battery

(D-1)

This camcorder uses a lithium battery to activate the clock, and to keep a title and birthdays/ anniversary in memory. Before operating it for the first time, install the supplied lithium battery.

Be sure to attach the power source before installing the lithium battery.
If you proceed in a wrong order, do it over again in the correct order.

1 Open the cover of the lithium battery compartment on the bottom of the camcorder.

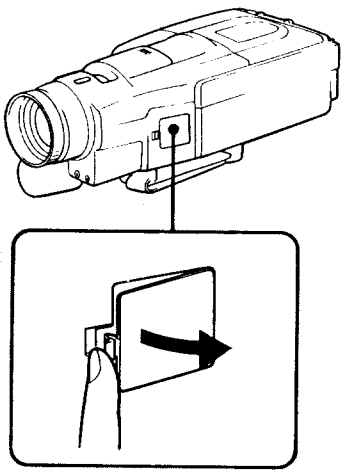
2 Install the supplied CR2025 lithium battery with the + side facing out.

3 Close the cover.

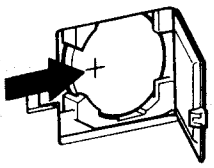
To remove the lithium battery (D-2)
Press the side of the battery in the direction as indicated for installation.

(D-1)

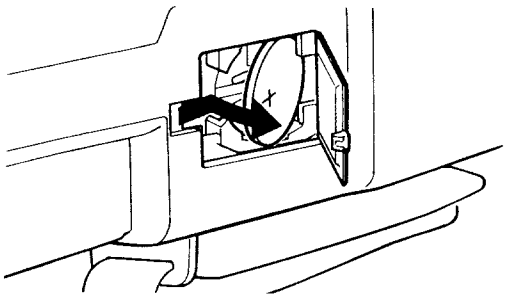
1



2



(D-2)



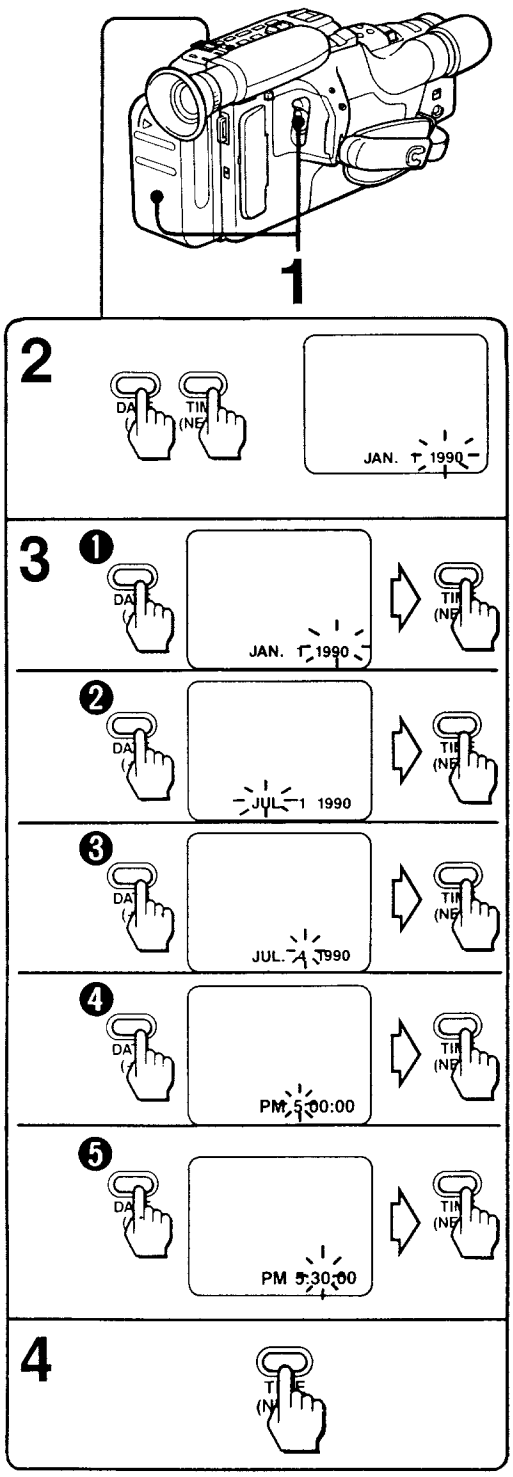
Note on lithium battery life
The battery will last for approximately 1 year in normal operation.
When the lithium battery becomes weak, the time indication will blink in the viewfinder screen for about 5 seconds (when POWER is set to CAMERA). In this case, **replace the battery with a Sony CR2025 lithium battery. Use of another battery may present a risk of fire or explosion.** After replacing the battery, readjust the date, time, title, birthdays, and anniversary. (If the battery is replaced while the battery pack is attached, the readjustments are not necessary.)

Cautions
- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.

WARNING
Battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

Setting the Date and Time

(D-3)



Setting the Date and Time

(D-3)

1 **Make sure that a power source is connected, set POWER to CAMERA, and slide STANDBY up.**

2 **Press DATE (+) and TIME (NEXT) simultaneously for more than 3 seconds until the date indication blinks in the viewfinder screen.**
DATE now functions as + (to advance numbers) and TIME functions as NEXT (to execute).
If you missed the number you wanted, keep + pressed. The digit will return to the original one.

3 **Adjust the year, month, day, hour, and minute, in that order.**
First adjust the blinking digits with +, and then press NEXT.

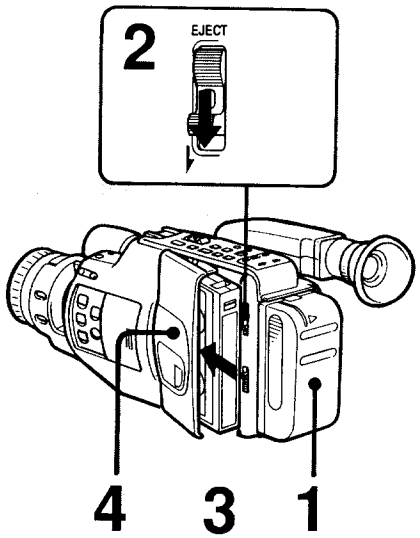
4 **Press NEXT to set the second to "00".**
The clock starts operating.

To correct date and time setting
Repeat steps 2 to 4.

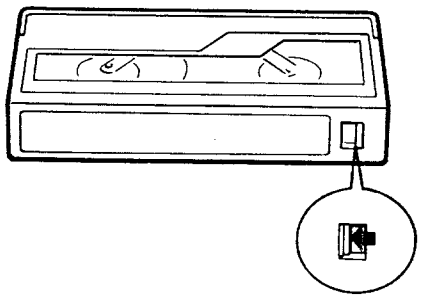
To advance the digits faster
Keep + pressed.

To check the preset date and time
Press DATE or TIME. When you press the same button again, the indication goes off.

(E-1)



(E-2)



Preparing your camcorder 3

Inserting Tapes

(E-1)

1 Make sure a power source is connected.

2 While pressing the small button, slide EJECT.
The cassette holder will automatically open. Do not pull the cassette holder forcibly when it is moving.

3 Insert a tape with the window facing outside.

4 Press the PUSH mark to close the cassette holder.

Ejecting the Tape

1 Make sure that a power source is connected.
2 While pressing the small button, slide EJECT.
3 The cassette holder will automatically open.
4 Take out the tape and press the PUSH mark to close the cassette holder.

Preventing Accidental Erasure

(E-2)

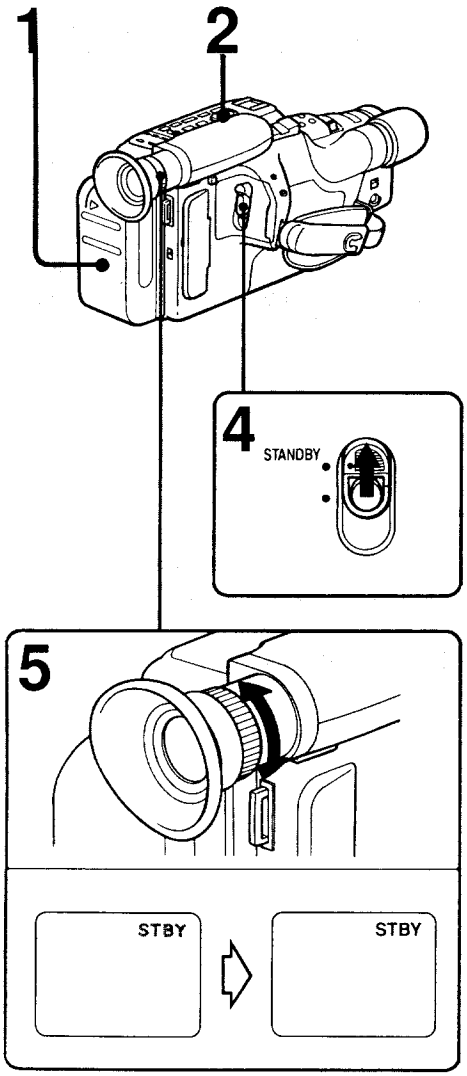
Slide in the red tab on the cassette to prevent recording.
To re-record on this tape, slide the tab back out.

Notes on handling tapes

- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the type and thickness of the tape, or if the tab is out or in, etc.
- Store tapes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.

Adjusting the Viewfinder Lens

(F)



The position of the viewfinder lens for optimum vision varies depending on the person. Adjust it when using the camcorder for the first time, or when using it after someone else. **(F)**

1 Make sure a power is connected.

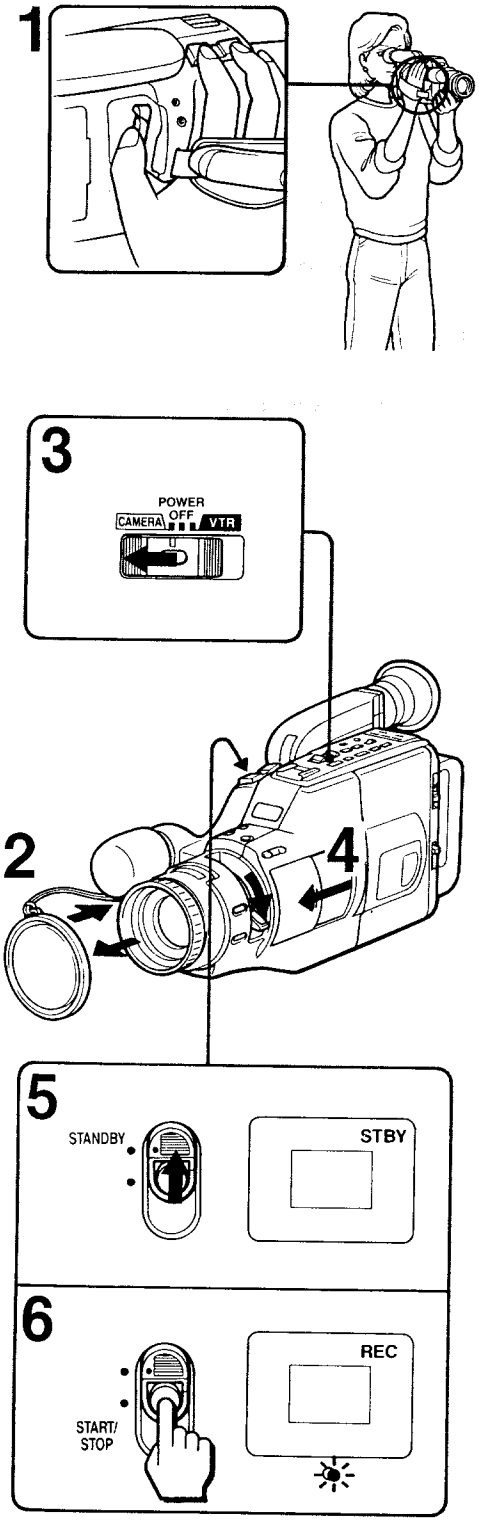
2 While pressing the green button, set POWER to CAMERA.

3 Insert a tape. (page 20)

4 Slide STANDBY up.

5 Turn the viewfinder lens adjustment ring so that the "STBY" displayed in the viewfinder screen comes into sharp focus.

(G-1)



Recording a Picture Using Automatic Adjustment

Make sure the preparations on page 11 are complete before recording.

Start Recording

(G-1)

Before recording "once-only" events, we strongly recommend making a trial recording and checking that everything is working perfectly.

1 Hold the camcorder as in the figure.
Put your hand through the grip strap and make sure that your thumb can easily touch START/STOP.

2 Remove the lens cap. (page 11)

3 While pressing the green button, set POWER to CAMERA.

4 Close the AUTO LOCK cover and turn the zoom lever downwards.

5 Slide STANDBY up.
"STBY" and the auto-focus frame appear in the viewfinder. The camcorder is now in the standby mode, and focus is adjusted automatically inside the frame (auto-focus adjusting range). Do not turn or stop the focus ring forcibly.

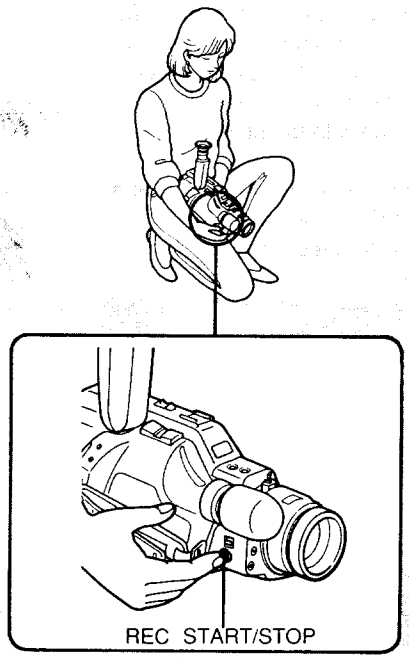
6 Press START/STOP.
"REC" appears and the red lamp lights up in the viewfinder. The camcorder is now recording.

To pause (to stop momentarily)
Press START/STOP again.
"STBY" appears in the viewfinder. The camcorder is in standby mode again.

To stop
Slide STANDBY down and set POWER to OFF.

Recording a Picture Using Automatic Adjustment

(G-2)



For low-position shooting (G-2)

The viewfinder can be turned up 90 degrees. Use the REC START/STOP button on the front right of the camcorder.

1 Press REC START/STOP to start recording.
2 Press it again to stop recording.

Notes on recording

- To record from the beginning of the tape, run the tape for about 15 seconds before recording. This will avoid missing the starting point when the tape is played back.
- If POWER is moved during recording, the tape will stop.
- When moving from indoors to outdoors, or vice versa, slide STANDBY up and point the camcorder at a white object for about 15 seconds so that the white balance is properly adjusted.!

Note on standby mode

If you leave the camcorder in the standby mode for 5 minutes or more, the camcorder will be automatically turned off. To resume the standby mode, slide STANDBY down once and slide it up again. To start recording, press START/STOP directly.

Note on light sources

If you are shooting a subject under bright conditions just after shooting in a dark place, the picture may not appear in the viewfinder. In this case, point the camcorder to another direction.

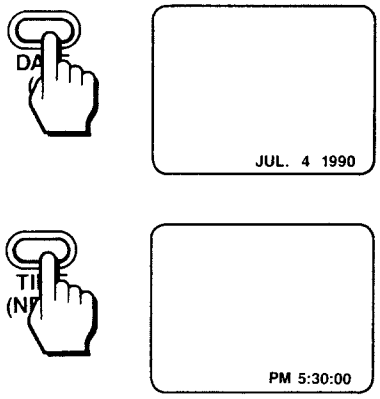
Recording mode

This camcorder records in the SP (approximately 1.43 cm/second) and can play back in the SP mode and the LP mode (approximately 0.72 cm/second). The quality of the playback picture in the LP mode, however, will not be as good as that in the SP mode.

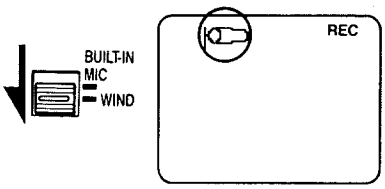
Notes on PCM recording and playback

PCM recording or playback is not possible with this camcorder.
The PCM sound recorded or after-recorded with another video recorder cannot be played back with this camcorder.

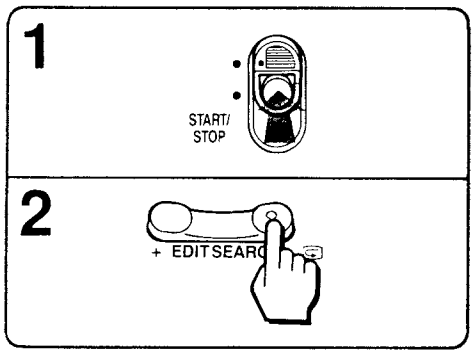
(G-3)



(G-4)



(G-5)



Recording a Picture Using Automatic Adjustment

To Record Date and Time

(G-3)

Press DATE for the date indication or TIME for the time indication during camera recording or when in recording pause mode.
The date or time displayed in the viewfinder is recorded with the picture.

To stop recording date or time
Press DATE or TIME again.
The picture recording continues.

When There is a Strong Wind

(G-4)

Set BUILT-IN MIC to WIND.
The noise from the wind will reduced.
After recording, set it to the upper position (green mark).

To Check the Last Portion of the Previous Recording

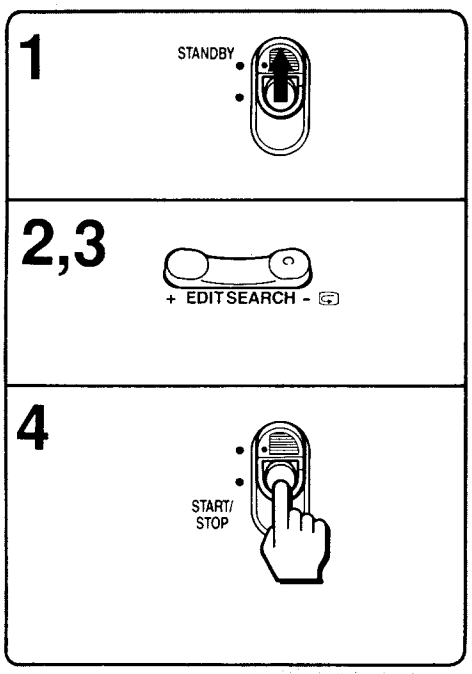
(G-5)

1 Set the camcorder in the recording pause mode by pressing the START/STOP button.

2 Press ⊜ side of EDITSEARCH momentarily.
The last few seconds of the recorded portion are rewound and then the recorded picture appears in the viewfinder. After a few seconds of playback, the camcorder goes back to recording pause mode.

If the picture has not been recorded
The video heads may be contaminated. Clean the heads using the Sony V8-25CLH video head cleaning cassette or equivalent.

(G-6)



Recording a Picture Using Automatic Adjustment

To Re-record a Previously Recorded Portion

(G-6)

1 **Slide STANDBY up to set the camcorder to the standby mode.**

2 **Look in the viewfinder and find the point from where you want to begin the recording:**
Keep pressing the + side of EDITSEARCH to advance the picture at a normal playback speed, or the – side to reverse the picture.

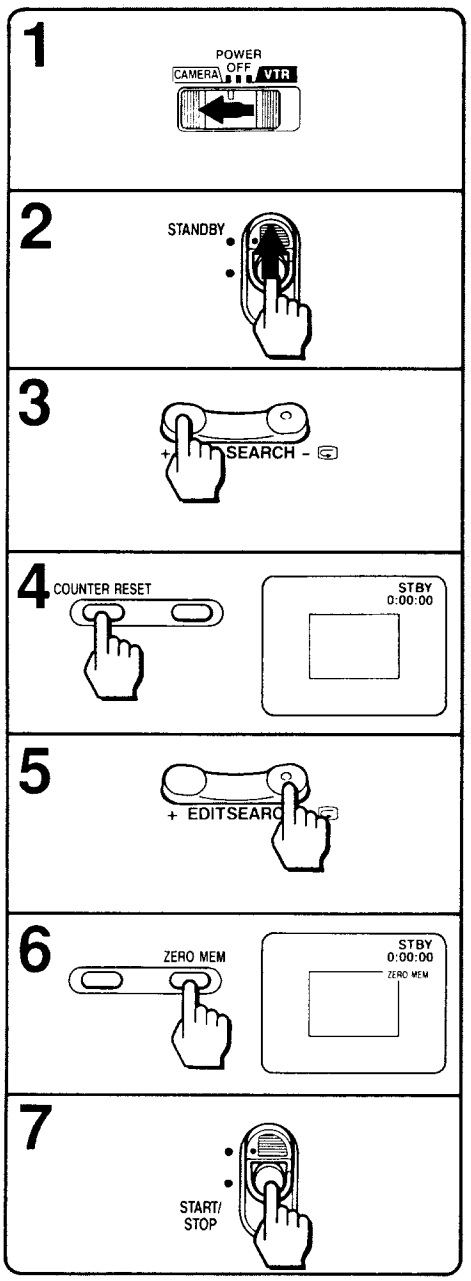
3 **At the desired point, release EDIT-SEARCH.**

4 **Press START/STOP to start recording.**

The picture is connected smoothly after the pre-recorded portion even if STANDBY is slid down and slid up, or even if the power is turned off and on again, provided that the tape is not removed.

To stop
Slide STANDBY down.

(G-7)



Recording a Picture Using Automatic Adjustment

To Re-record a Picture in the Middle of a Recorded Tape (Insert Recording)

(G-7)

1 **While pressing the green button, set POWER to CAMERA.**

2 **Slide STANDBY up to set the camcorder to standby mode.**

3 **While looking in the viewfinder, keep pressing the + or – side of EDITSEARCH and release the button where you want to end the insertion.**
The camcorder is set to standby mode again.

4 **Press COUNTER RESET.**
The counter is reset to zero.

5 **While looking in the viewfinder, keep pressing the – side of EDITSEARCH and release the button at the point where you want to start the insertion.**

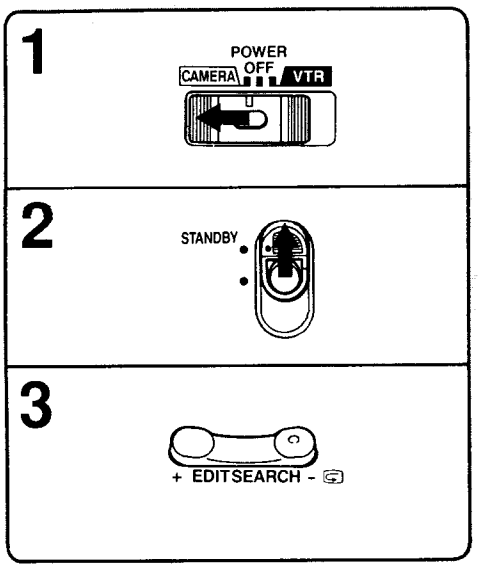
6 **Press ZERO MEM.**
The insert ending point is stored in memory.

7 **Press START/STOP.**
Insert recording begins, and stops automatically near the counter zero point.

To cancel the ZERO MEM
Press ZERO MEM.

Note
The picture may be distorted at the end of the inserted portion when it is played back.

(G-8)



Recording a Picture Using Automatic Adjustment

Playing Back the Picture Instantly

(G-8)

You can check the recorded picture in the viewfinder. Sound is not heard.

1 While pressing the green button, set POWER to CAMERA.

2 Slide STANDBY up.

3 Keep pressing the + or – side of EDIT-SEARCH to play back the picture.

+ side: to view the playback picture
– side: to view the playback picture in reverse

To stop playback

Release EDITSEARCH.

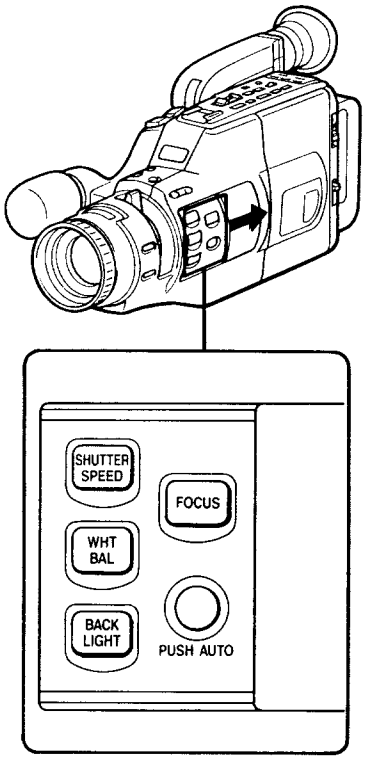
To monitor the sound while viewing the playback picture in the viewfinder

Connect an earphone to the jack.

1 While pressing the green button, set POWER to VTR.
2 Press ◀◀ to rewind the tape and press □ where you want to stop.
3 Press ▷ to start playback.

Selecting the Automatic/ Manual Adjustment

(H-1)



When you close the AUTO LOCK cover, the focus, white balance, and exposure (back light) are adjusted automatically, and the shutter speed is set to 1/60.
The automatic function offers you worry-free operation under most shooting conditions. But under certain circumstances, manual adjustment is better for effective recording. For manual adjustment, open the AUTO LOCK cover and select an appropriate setting.

Looking Over Each Button

(H-1)

FOCUS:
Press to set the camcorder in the manual focusing mode.
Once the focus is adjusted, the setting is locked. (See page 29.)

PUSH AUTO:
Keep pressing to achieve autofocusing temporarily in the manual focusing mode. (See page 30.)

WHT BAL:
Press to lock the white balance in the ☀ (outdoors), ☼ (indoors), or HOLD mode. The tone of colors is fixed regardless of the lighting condition. (See page 31.)

SHUTTER SPEED:
Press to increase the shutter speed to record a fast-moving subject, such as golf or tennis swing, clearly. (See page 33.)

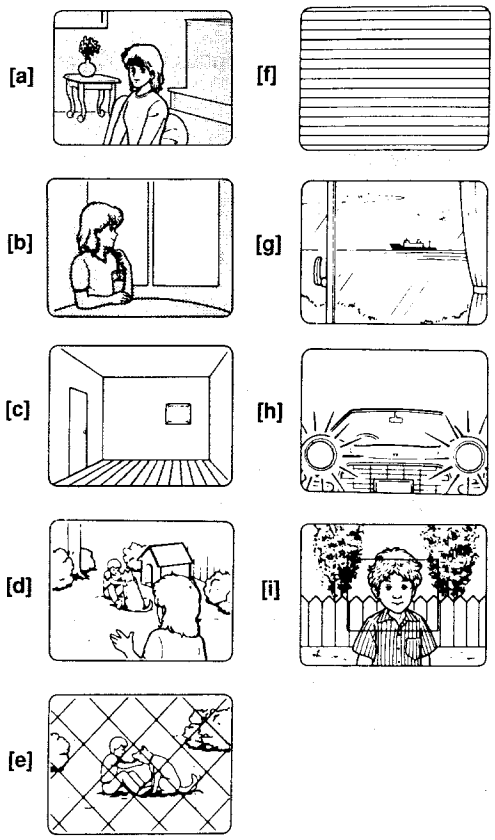
BACK LIGHT:
Press when a subject appears dark against a bright background. (See page 34.)

Even if you open the AUTO LOCK cover
The setting of each function is the same as the automatic adjustment until you change it.

Notes
- Even when you set POWER to OFF, previous settings are retained. They are cancelled if the power source is disconnected for more than 5 minutes.
- If you close the AUTO LOCK cover after you have made manual adjustment and then open it again, the previous settings for manual adjustment will be recalled.

Manual Focusing

(I-1)



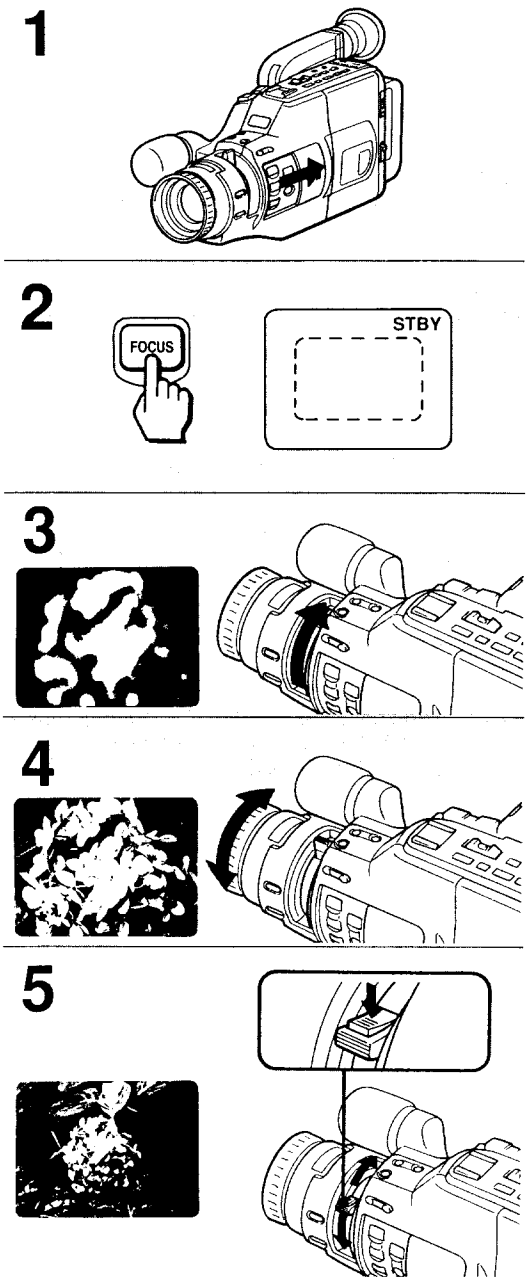
When you close the AUTO LOCK cover, the autofocusing functions and you can easily get a focused picture under most shooting conditions. But manual focusing is recommended in the following cases.
[a] to [j] correspond to the illustrations. (**I-1**)

[a] Insufficient light
[b] Too much brightness behind the subject
[c] Subjects with little contrast -- wall, sky, etc.
[d] One subject is close; the other is in the center, but at a distance
[e] Subjects beyond nets, etc., or another subject passes in front of the camcorder
[f] Horizontal stripes
[g] Subject through frosted glass
[h] Bright subject or subject reflecting light
[i] High contrast behind the subject (The background may be focused.)
[j] Under the following circumstances
- When using conversion lenses or effect filters
- When shooting a stationary subject using a tripod
- To save battery wear

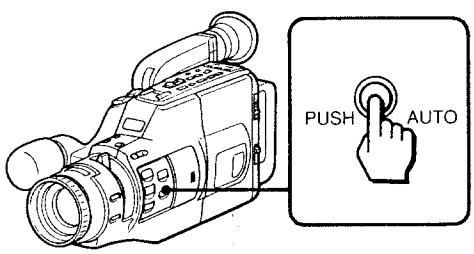
Autofocusing does not function momentarily when:
- The setting of the shutter speed is changed.
- Back light is adjusted manually.
- Lighting conditions change quickly.
- Zooming is done from wide-range to telephoto.

This camcorder keeps in focus by referring to the picture contrast, which is weak in the above situations.

(I-2)



(I-3)



Manual Focusing

Focusing Manually

(I-2)

1 Slide open the AUTO LOCK cover.

2 Press FOCUS.
Make sure that the autofocus frame goes off in the viewfinder.

3 Turn the manual zoom lever fully to the telephoto position.

4 Turn the focus ring to achieve sharp focus.

5 Set the desired shot length using the manual zoom lever while pressing the button on it.

Shooting with autofocusing momentarily (I-3)
While shooting with manual focusing, press PUSH AUTO.
The autofocus functions **while you are pressing the button.** When you release the button, manual focusing will be resumed. Use this button when you change the focus from one subject to another. The focusing performs naturally.
The previous settings of the shutter speed, white balance, and back light are retained.

Some helpful hints

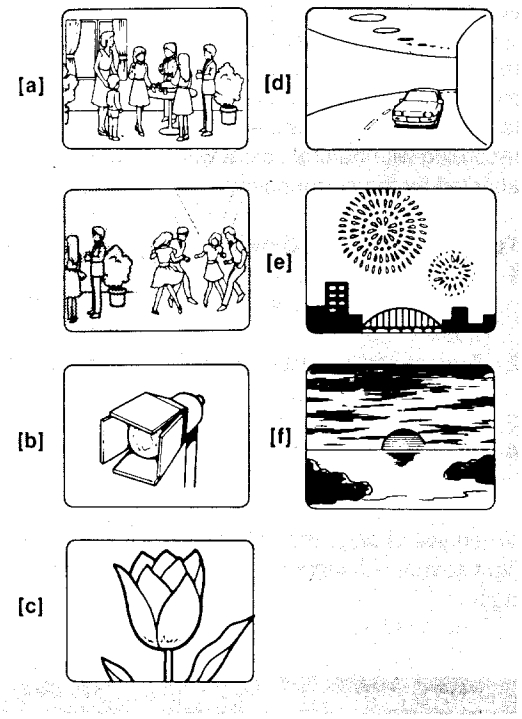
- When shooting in relatively dark places such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles after focusing in telephoto.
- When shooting a scene with lots of movement in bright light, set the zoom lever to the wide-angle position and the focus ring to 2 m.

Adjusting the White Balance

When you close the AUTO LOCK cover, the auto white balance function of this camcorder adjusts the picture to natural colors under most shooting conditions. However, in the conditions listed below, adjust the white balance manually.

[a] to [f] correspond to the illustrations. (J-1)

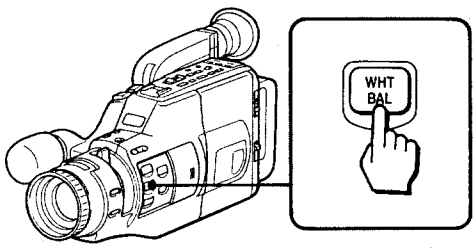
(J-1)



	Conditions	Indication in the viewfinder
[a]	Lighting conditions change quickly	-☼-
[b]	Too bright, such as in photograph studios	
[c]	Monochromatic subject or background	HOLD
[d]	Under a sodium lamp	-☼-
	Under a mercury lamp	
	Under a color matching fluorescent lamp	☀
[e]	Recording outdoors: a night view, neon signs, or fireworks	
[f]	Recording outdoors: scenes after sunset or before sunrise	

Adjusting the White Balance Manually

(J-2)



1 Slide open the AUTO LOCK cover.

2 Select the desired white balance mode by pressing WHT BAL.

Each time you press the button, the indication changes as follows.

No indication (auto) → HOLD → ☀ → -☼-

Note on manual adjustment

When moving from indoors to outdoors, or vice versa, close the AUTO LOCK cover and open it again.

Adjusting the White Balance

What is the HOLD mode?
In the HOLD mode, the camcorder automatically adjusts to the color temperature of the subject's light source and keeps that temperature during recording. When recording some subjects with different color temperatures, use the HOLD mode to set a color temperature. You can achieve a recording with natural colors without being affected by the surroundings.

To set into the HOLD mode
1 Close the AUTO LOCK cover.
The white balance will be set to the automatic mode.
2 Point at and record a white, flat object such as a white wall or paper.
3 Open the AUTO LOCK cover.
4 Press WHT BAL to display the HOLD mark in the viewfinder.

When you change the battery pack or when the light source is changed, follow this procedure again.

Color Temperature and White Balance

(J-3)

The color temperature indicates a property of light and is measured in K (Kelvin). It increases as the light source gets bluer and decreases as the light source gets redder. It has no direct relationship with brightness. The camcorder automatically adjusts the white balance within the range shown below.

(J-3)

Color temperature (K)		Light source
↑	10,000	Clear
	8,000	
Blue		Slightly overcast
	7,000	Cloudy, rainy
	6,000	Fluorescent lamp (daylight)
	5,000	
White		Direct sunlight
		Fluorescent lamp (daylight)
	4,000	1 hr. after/before sunrise/sunset
	3,500	↑ Fluorescent lamp (off-white)
		Studio lamp
		Halogen lamp
	3,200	
	3,000	
Yellow		↓ Tungsten lamp
	2,500	30 min. after/before sunrise/ sunset
Red		↓
	2,000	Sunrise/sunset
↓		Candlelight

Setting Shutter Speed

(K-1)

When a fast-moving subject is recorded at normal shutter speed, it may not be seen clearly when played back in the pause mode (still picture). This can be improved by increasing the shutter speed. Six shutter speeds can be selected: 1/60 (normal speed), 1/100, 1/250, 1/1000, 1/2000, or 1/4000 of a second. **(K-1)**

When recording at a high-speed shutter setting, record in a brighter place than usual.

Also, the depth of field in proper focus becomes shallow at a higher shutter speed. This is effective to record the main subject in sharp focus and the surroundings out of focus.

Recommended setting for your situation

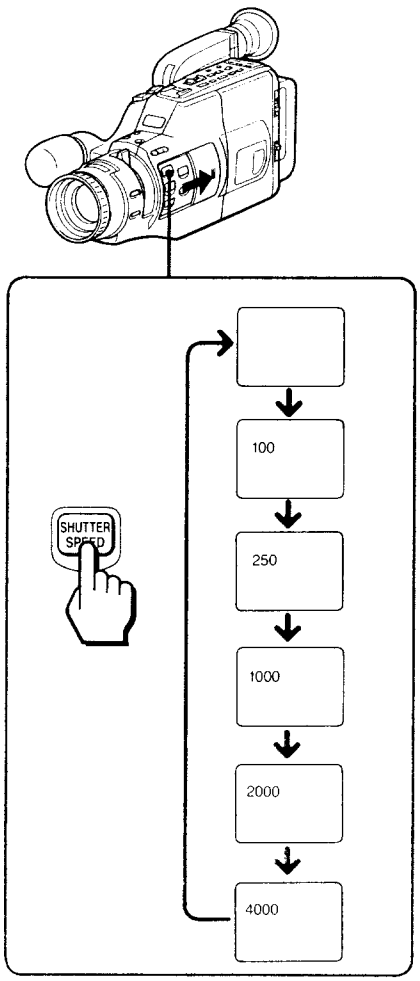
Choose an appropriate shutter speed according to the situation, referring to the chart below for examples.

Example use	Recommended shutter speed
• On clear days, recording golf or tennis swing (To view the hit ball clearly in the still picture mode, set to 1/4000) • Recording skiers	1/4000 or 1/2000
• On overcast days, recording a moving merry-go-round or roller coaster • Recording outdoors from inside a vehicle (for stable shooting)	1/1000 or 1/250
• Instead of the ND2 filter (To reduce the exposure level to about a half) • Recording indoor sports (for stable shooting)	1/100

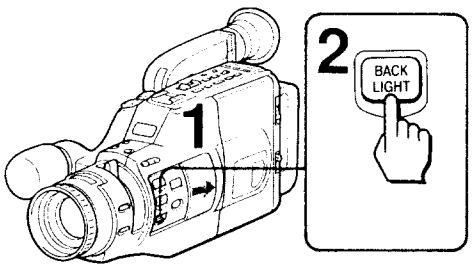
When playing back the picture recorded at certain speeds

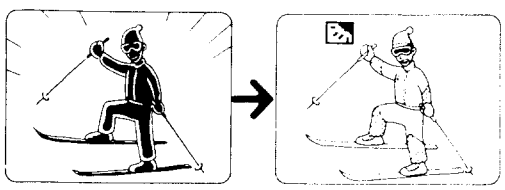
Use 8 mm video equipment with the clean still function to obtain the noiseless still picture.

(K-2)



(L)





Setting Shutter Speed

Selecting the Shutter Speed

(K-2)

1 Slide open the AUTO LOCK cover.

2 Press SHUTTER SPEED repeatedly until the desired shutter speed indication appears.

Each time you press the button, the indication changes as follows.

→ No indication (1/60) → 100 (1/100) → 250 (1/250) →
← 4000 (1/4000) ← 2000 (1/2000) ← 1000 (1/1000) ←

Notes

- When you select shutter speed 1/250 or faster, record under sunlight or use a video light.
- When you record a TV screen with certain shutter speeds, the brightness of the recorded picture may vary.
- When you shoot a very bright subject at a faster shutter speed, a light vertical, belt-like line (smear) may appear on the screen.
- When you record at certain shutter speeds under a light discharged tube, such as a fluorescent lamp, sodium lamp, or mercury lamp, the brightness of the recorded picture may vary (flicker).

Shooting with Backlighting

In this camcorder, the exposure is automatically controlled. However, when shooting a subject that is backlit, that is, if the light source is coming in from behind the subject, use the BACK LIGHT button. **(L)**

1 Slide open the AUTO LOCK cover.

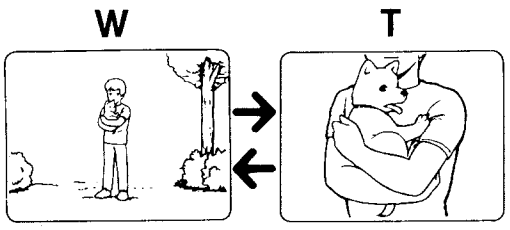
2 Press BACK LIGHT.

The ⊡ indication appears.

After shooting

Be sure to release this adjustment setting by pressing BACK LIGHT again. (The ⊡ indication goes out.)
Otherwise, the recorded picture will be too bright.

(M-1)



Zooming

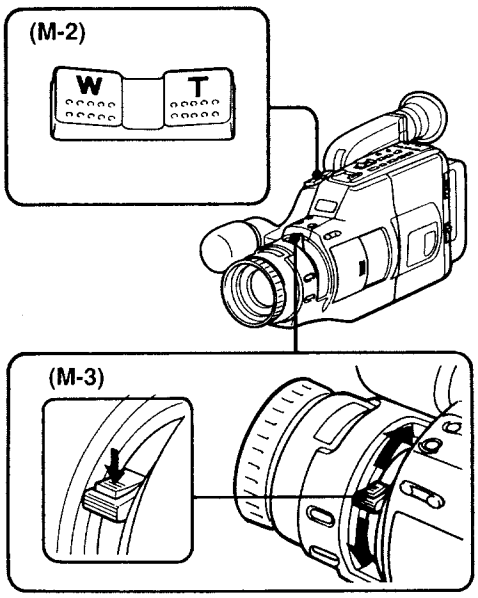
The size of the subject in the screen can be changed. Use "zoom-in" for dramatic close-ups. Use "zoom-out" for panoramic long shots. Also use zooming to focus manually or to decide the shooting angle. **(M-1)**

Power Zooming

— for smooth and constant zooming (M-2)
Press the T side of the power zoom button for telephoto (subject appears closer) and the W side for wide-angle (subject appears farther away).

Zooming Manually

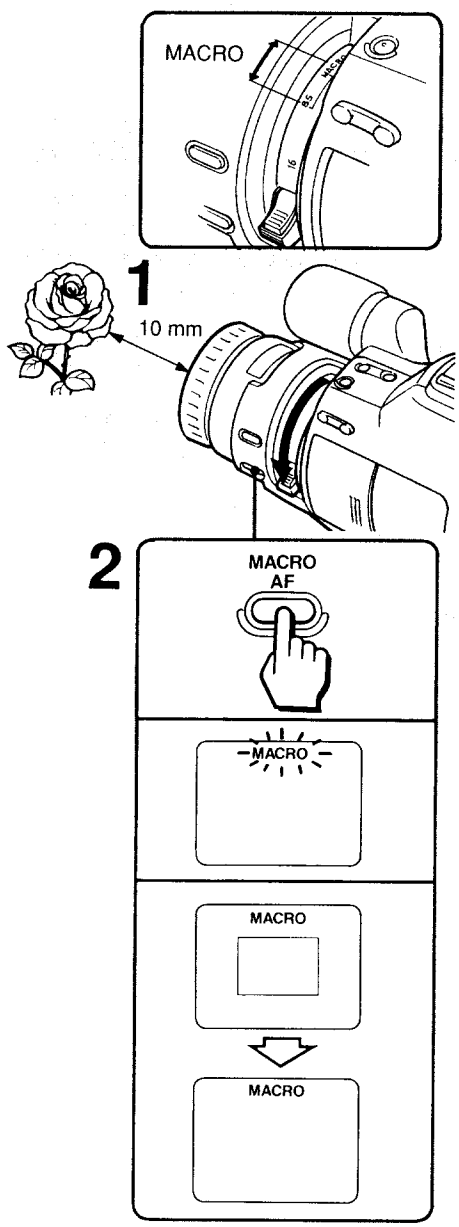
— for creating a dramatic effect (M-3)
Turn the manual zoom lever upward for telephoto and downward for wide-angle.
Be sure to keep pressing the button on the lever when turning it downward.



Focal length of this camcorder
The focal length is 8.5 mm to 68 mm ($^1/_3$ to $2^3/_4$ inches). This means approximately 45 mm to 363 mm ($1^3/_4$ to $14^3/_8$ inches) converted into the focal length of a 35-mm camera.

Close-up (Auto-focusing in Macro)

(N-1)



Even tiny subjects, such as flowers, insects, photographs, can literally fill the screen with auto-focusing in macro.
This is useful also when storing a title (page 39).
(N-1)

1 Bring the camcorder as close as necessary to obtain the desired subject size.
The subject can be as close as a minimum of 10 mm (13/32 inches) from the lens surface.

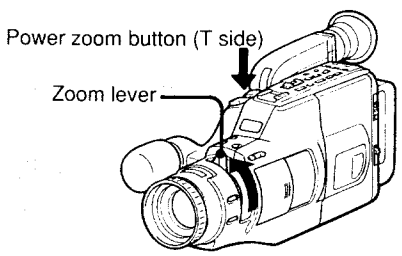
2 Press MACRO AF.
(1) The zoom lever turns automatically to the MACRO range.
The MACRO indication blinks in the viewfinder and lights steadily when the zoom lever enters the MACRO range.
(2) The autofocus frame appears in the viewfinder and the focus is adjusted automatically.
The frame disappears when sharp focus is achieved.

To release this adjustment setting
Press the T side of the power zoom button or turn the zoom lever, to return the lever to the ordinary range.
(N-2)

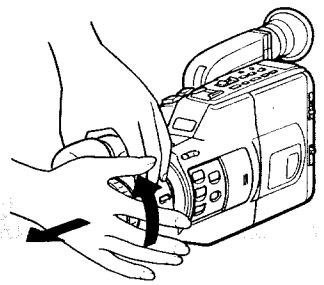
If the autofocus frame disappears before focusing sharply
The autofocus frame disappears if sharp focus cannot be achieved within 30 seconds. In this case, press MACRO AF again to re-function autofocusing in macro.
If you still do not get a sharp focus, manual focusing is recommended (page 37). Adjust it after the autofocus frame goes out.

To keep autofocus functioning
Keep MACRO AF pressed.
Contrary to the ordinary auto-focusing (page 22), autofocusing in macro is released each time the sharp focus is achieved.

(N-2)



(N-3)



Close-up (Auto-focusing in Macro)

Notes

- This function has no connection with the AUTO LOCK cover. You can use autofocusing in macro while manually adjusting the ordinary focus, etc.
- Do not press the power zoom button while the zoom lever is moving for autofocusing in macro. Otherwise, autofocusing is released.

Manual focusing in macro

1 Turn the zoom lever to the MACRO range without pressing the button on it.
The MACRO indication lights up in the viewfinder.
2 Turn the zoom lever within the MACRO range to focus sharply.

If the lens hood touches the subject

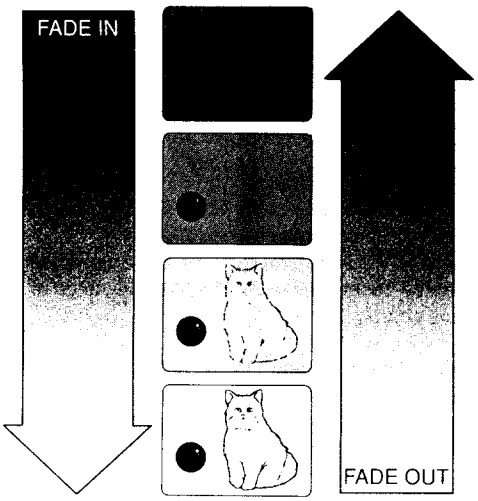
Remove the lens hood. Hold the focus ring and turn the hood by pressing it with your palm. **(N-3)**
Do the same when attaching/removing a filter or conversion lens (not supplied).

Recommended accessory

When shooting in macro, the depth of field is very shallow, so pay attention to focusing. To keep the subject in focus, use a tripod.

Fade-in and Fade-out

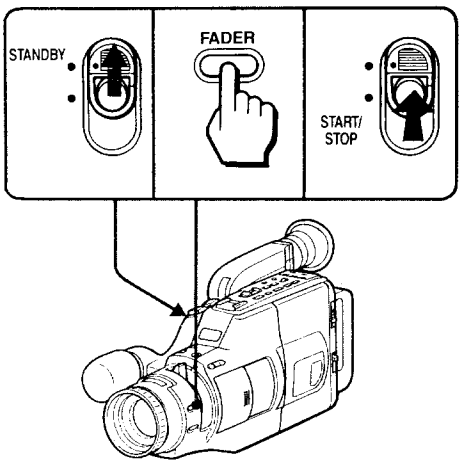
(O-1) (O-2)



When fading-in, the picture will gradually appear from a black screen. The sound will also gradually increase. **(O-1)**
When fading-out, the picture will gradually disappear to a black screen. The sound will also gradually decrease. **(O-2)**
This function will give your recording a professional appearance.

To Fade-in

(O-3)



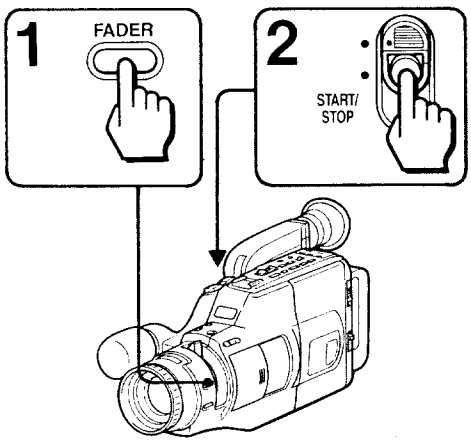
1 Slide STANDBY up to set the camcorder in the standby mode.

2 Press FADER.

3 Press START/STOP.
Fade-in is performed and then recording will start.

To Fade-out

(O-4)



1 While recording, press FADER.

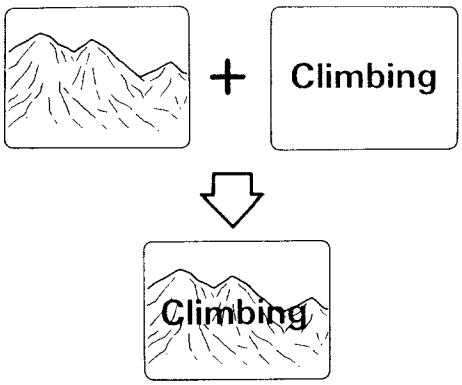
2 Press START/STOP to stop the recording.
Fade-out is performed and then recording stops.

To cancel the fade-in/fade-out function before it is performed
Press FADER again before pressing START/STOP.

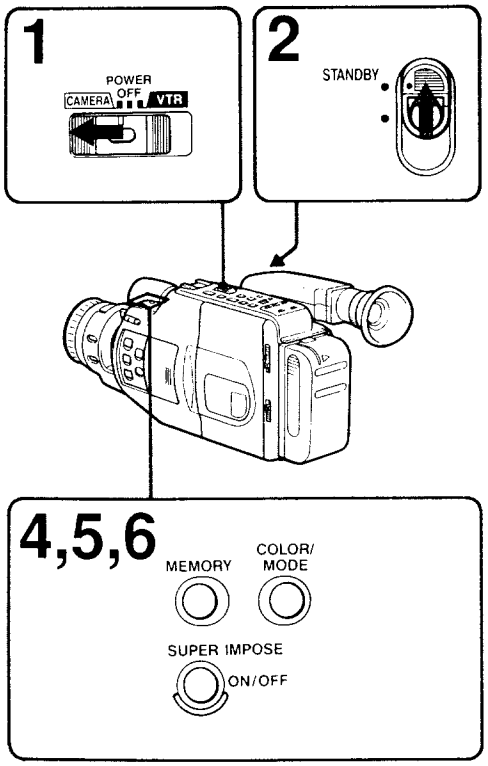
If you want to use the fade-in/fade-out function repeatedly
Start from step 1 each time.

When the title (page 40), date/time (page 24), or age (page 45) is displayed
The title, date/time, or age does not fade-in or fade-out.

(P-1)



(P-2)



Recording a Title

You can superimpose your own hand-lettered message or illustration over the picture during recording or playback (editing). **(P-1)**

- One title can be stored
- The color of the title can be selected from 8 colors.

Before recording, store a message or an illustration in the camcorder.

Storing a Title (P-2)

Before storing

- Make a desired title card.
  Use a plain, white card and draw a title with a dark color in thick letters.
- Install the lithium battery. (page 18)

Operation

1 **While pressing the green button, set POWER to CAMERA.**

2 **Slide STANDBY up to set the camcorder in the standby mode.**

3 **Point the camcorder to the title card and adjust the focus.**
To focus the subject, use the autofocusing in macro function. (page 36)

4 **Press MEMORY to store the title.**

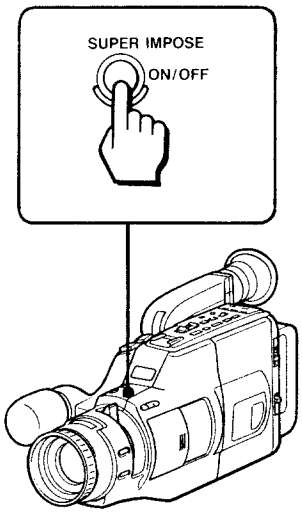
5 **Press COLOR/MODE and select the title color.**
Each time you press the button, the indicaiton changes as follows.
WHT(white) → BLUE → GRN(green) → CYAN → RED
↑BLK(black) ← YEL(yellow) ← VIO(violet) ←——┘

6 **Press ON/OFF to turn off the title.**
The title is stored in memory until you change it.

To check the title
Press ON/OFF in the standby mode.
To turn off the title, press the button again.

About memory back up
The camcorder uses the lithium battery on the bottom to keep the title in memory. On lithium battery life, see page 18.

(P-3)



Recording a Title

Superimposing the Title on a Picture

(P-3)

1 During playback or recording, press ON/OFF at the point from which you want to insert the title.
The title is displayed. During recording, the title is recorded.

2 Wait for a while and press ON/OFF.
The title goes out.

When recording the title at the beginning
We recommend the following method:
1 Set the camcorder in the standby mode before step 1 above.
2 Release the standby mode after displaying the title, then go to step 2 above.

If you want to record the title during playback
Make connections for editing and record the title on another VCR. (See page 52.)
The title cannot be recorded on this camcorder during playback.

About the color indication
- The color indication in the viewfinder is not recorded.
- You can change the title color by pressing COLOR/MODE even after displaying the title.

When displaying the title in the recording standby mode
The title goes out if you press EDITSEARCH.

Recording a Title

Various Display Modes of the Title

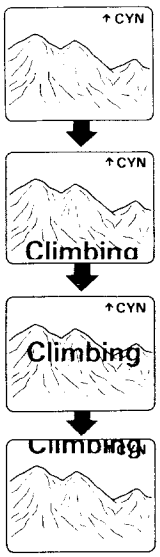
Display mode	Indication in the viewfinder
Scrolling up the title (P-4) The title scrolls up and stops at the center.	↑
Scrolling down the title (P-5) The title scrolls down and stops at the center.	↓
Reversing the title with the picture (P-6)	▯
Scrolling up the reversed title (P-7)	▯↑
Scrolling down the reversed title (P-8)	▯↓
Normal display mode	No indication

Selecting the display mode
Before displaying the title, press COLOR/MODE until the indication of the mode you want appears. (P-9)

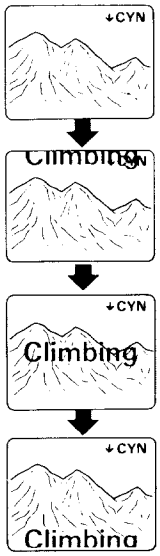
After selecting the mode, follow the procedure on page 40 to superimpose the title on the picture in that mode.

Note on scrolling
You can scroll the title only when the camcorder is in the recording standby, recording, or normal playback mode. In the other modes (see "Various Playback Modes" on page 50), you can select only reversing (▯) or normal display mode. Also, scrolling will be cancelled when you set the camcorder in the other modes after selecting scrolling.

(P-4)

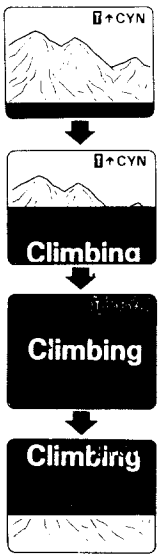


(P-5)

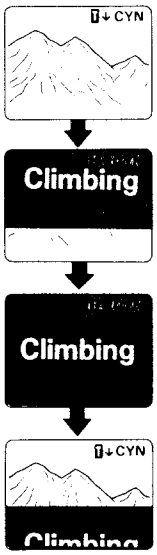


(P-6)

(P-7)



(P-8)



(P-9)

Recording a Title

(P-10)

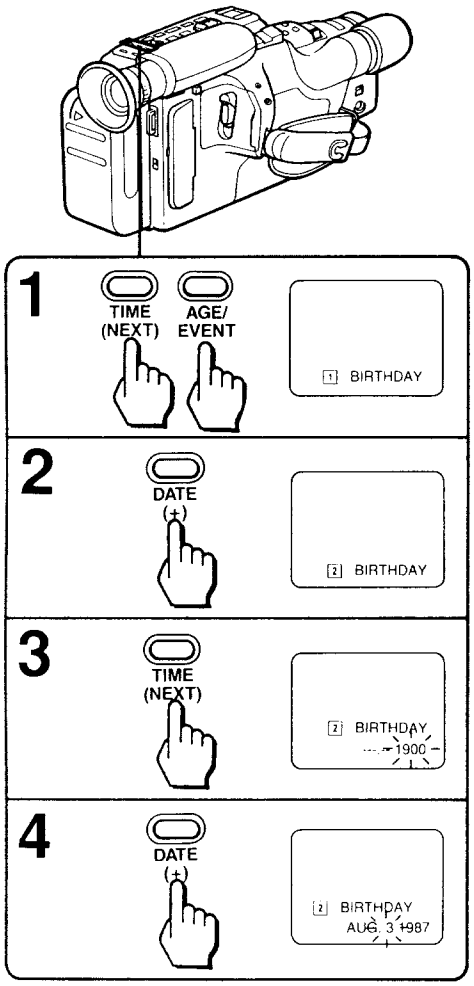
Function of the COLOR/MODE button
This button has a double function: one is to select the title color and the other is to select the title display mode.
Its function depends on if the title is displayed or not.
(P-10)

To select the color
1 Press ON/OFF to display the title.
2 Press COLOR/MODE.
Each time you press the button, the color indication changes as follows.
WHT(white) → BLUE → GRN(green) → CYAN → RED →
└BLK(black) ← YEL(yellow) ← VIO(violet) ←┘

To select the mode
1 If the title is displayed, press ON/OFF so that the title disappears.
2 Press COLOR/MODE.
Each time you press the button, the mode indication changes as follows.
No indication (normal mode) → ↑
└ ▯↓ ← ▯↑ ← ▯ ← ↓ ←┘

↑: Title scroll up mode
↓: Title scroll down mode
▯: Title reverse mode
▯↑: Title reverse and scroll up mode
▯↓: Title reverse and scroll down mode

(Q-1)



Recording the Age of Your Child

You can record the age (in years and months) of your child, by presetting his/her birth date. Besides age, you can also preset the date of a specific event, and record how many years and months have passed since then.
You can record up to 3 age or event.

Presetting the Birth Date/Event Date

Preparations

1 Connect the power source.
2 Set POWER to CAMERA while pressing the green button and slide STANDBY up.
You can see the display in the viewfinder.

Make sure that the date and time are set correctly. (page 19)
Otherwise, the birth date/event date cannot be preset correctly.

Operation (Q-1)

Example: Preset "AUG. 3 1987" as the birth date of the second person.

1 Press AGE/EVENT and TIME (NEXT) simultaneously for more than 3 seconds until the "[1] BIRTHDAY" indication appears and [1] blinks in the viewfinder.

2 Press DATE (+) to select [2].
Each time you press DATE (+), the display changes as follows:
[1] BIRTHDAY → [2] BIRTHDAY
↑— [3] EVENT ←—
Although "EVENT" is displayed on [3], you can use it for age as well. [1] and [2] can also be used for event.

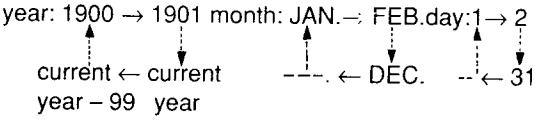
3 Press TIME (NEXT).
"---.-- 1900" is displayed.

4 Adjust the year, month, and day.
First adjust the blinking digits with DATE (+), and then press TIME (NEXT).
The age is displayed when all the items are adjusted.

Recording the Age of Your Child

If you missed the desired number with DATE (+)

Keep pressing DATE (+). The number changes as follows:



To correct/change the setting

Follow the procedure from step 1 again.

To advance the digits faster

Keep DATE (+) pressed.

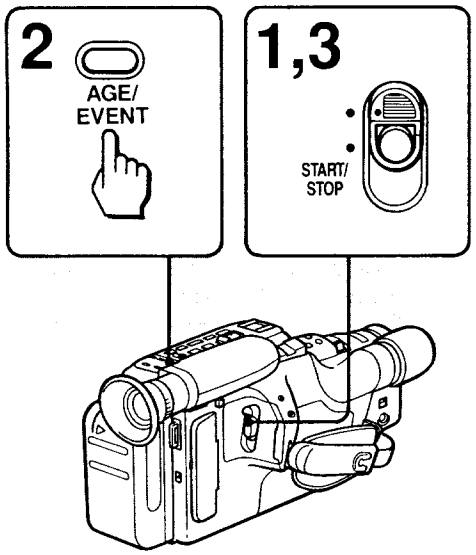
To preset the year before 1900

1 After step 3 on page 43, keep pressing DATE (+) until the current year is displayed.
2 Press DATE (+) again.
The year goes back 99 years.
(example: 1990 ➡ 1891)
3 Go to step 4.

When in 2000

"---.-- 1901" is displayed in step 3 on page 43. After that, it advances every year as "1902, 1903, ...".

(Q-2)



Recording the Age of Your Child

Recording the Age

(Q-2)

1 Press START/STOP at the point where you want to insert the age indication.
The camcorder is set in the standby mode.

2 Press AGE/EVENT to select the indication you want to record.
Each time you press AGE/EVENT, the indication changes as follows:

No indication → [1] The first age
[3] Anniversary ← [2] The second age
An item with no presetting is skipped.

The [1], [2], or [3] indication goes out.

3 Press START/STOP.
Recording starts again.
The age displayed in the viewfinder is recorded with the picture.

To stop recording the age
Press AGE/EVENT until the indication goes out.

To change the display while recording
Press AGE/EVENT until the indication you want to record is displayed. Recording of the indication you selected starts when [1], [2], or [3] goes out.

To cancel the stored birth date/event date
1 Proceed step 1 and 2 of "Presetting the Birth Date/Event Date" and select the item you want to cancel.
2 Press TIME (NEXT) twice.
"Month" blinks.
3 Press DATE (+) to display "--.--"
4 Press TIME (NEXT).
The birth date/event date is deleted from the memory and is not displayed when you press AGE/EVENT.

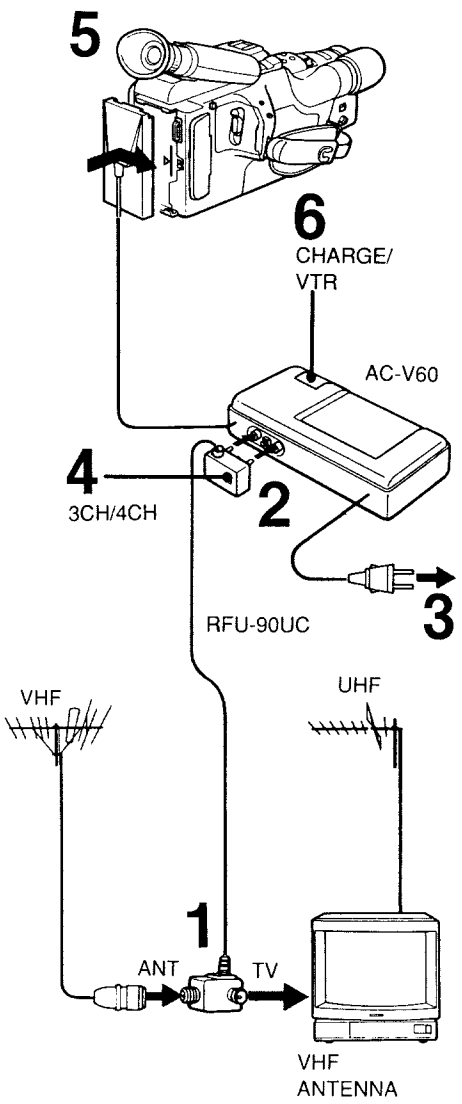
Recording the Age of Your Child

If you do not record the age while recording
You cannot add it later during playing back or editing. Be sure to follow the procedure "Recording the Age" while recording.

About memory back-up
The camcorder uses the lithium battery on the bottom to keep the birth date/event date in memory. On lithium battery life, see page 18

When you connect the camcorder to a TV
If you do not use the data-screen function, the age indication will appear on the TV screen when the [1], [2], or [3] indication goes out in the viewfinder and recording starts.

(R-1)



Connections for Playback

You can easily make a proper connection of camcorder and TV by using the supplied AC-V60 AC power adaptor.
Check the type of your TV, and go to the appropriate section.

You can also connect the camcorder directly to the TV, using the VIDEO·AUDIO (and RFU DC OUT) jacks. In this case, set the IN/OUT selector to OUT.

Connecting a TV without Video/ Audio Jacks (R-1)

Connecting the AC power adaptor and a TV

The supplied RFU-90UC RFU adaptor and AC power adaptor are required.
Make sure that the TV is turned off to prevent the speaker being damaged.

1 Connect the antenna and TV to the RFU adaptor.

2 Connect the RFU adaptor to the AC power adaptor.

3 Connect the AC power adaptor to a wall outlet.

4 If you have connected your TV using only the antenna socket, set the channel selector on the RFU adaptor to 3CH or 4CH of the VHF channel, whichever is not active in your area.
One of the TV channels will be adjusted to receive the camcorder's playback signal.

Usually keep the AC power adaptor and the TV connected.

Whenever playing back a tape

Proceed only the following two steps.

5 Attach the connecting plate of the AC power adaptor to the camcorder.

6 Set the CHARGE/VTR selector on the AC power adaptor to VTR (DC OUT).

Connections for Playback

If your TV is connected with a VCR (R-2)
Disconnect the antenna connection of the TV and the VCR, and insert the RFU adaptor between them.

Connecting a TV with Video/Audio Input Jacks (R-3)

The supplied AC-V60 AC power adaptor is required.
Make sure that the TV is turned off to prevent the speaker being damaged.

1 Connect the AC power adaptor to the TV.
Use a commercially available audio/video cable (like Sony VMC-710M/720M for monaural TV, or VMC-910MS/920MS for stereo TV).

2 Connect the AC power adaptor to a wall outlet.

Usually keep the AC power adaptor and the TV connected.

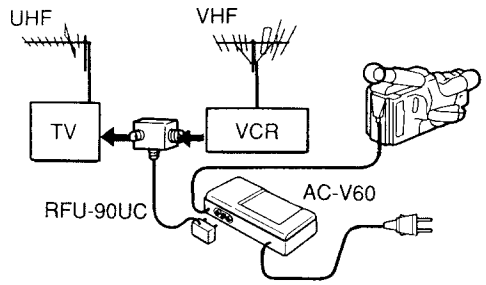
Whenever playing back a tape
Proceed only the following two steps.

3 Attach the connecting plate of the AC power adaptor to the camcorder .

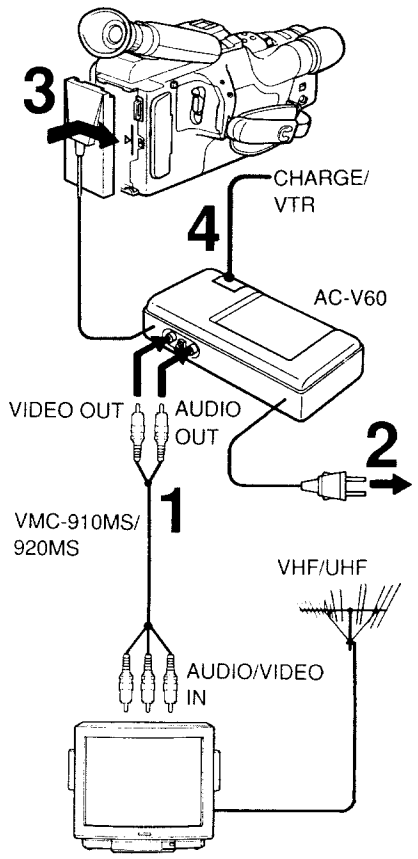
4 Set the CHARGE/VTR selector on the AC power adaptor to VTR (DC OUT).

If your TV is connected with a VCR (R-4)
Connect the AC power adaptor to the VCR instead of the TV.

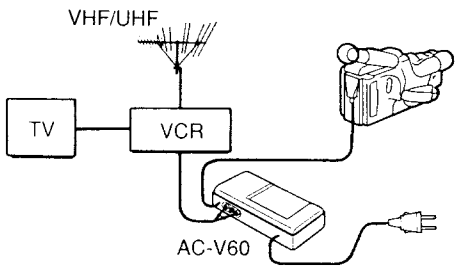
(R-2)



(R-3)

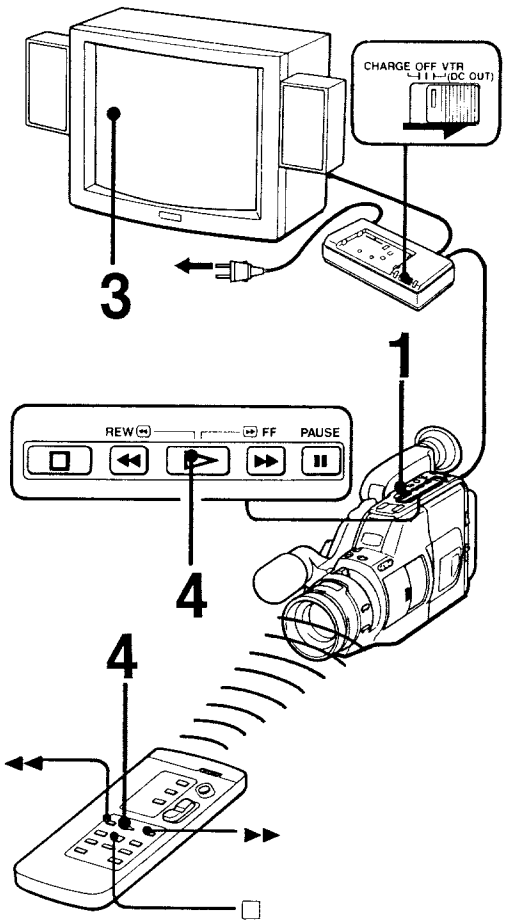


(R-4)



Playing Back a Tape

(S-1)



The supplied wireless Remote Commander is useful to control the camcorder from a distance. When using it, be sure to set the R switch to ON.
(S-1)

1 Set POWER to VTR while pressing the green button.

2 Insert a tape.

3 Turn on the TV (or the VCR).
For a TV with video/audio input jacks:
Set the TV/VIDEO selector to VIDEO.
For a TV without video/audio input jacks:
Select the channel for playing back the camcorder.

4 Press ▷.
Playback begins.
You can also use ▷ on the camcorder.

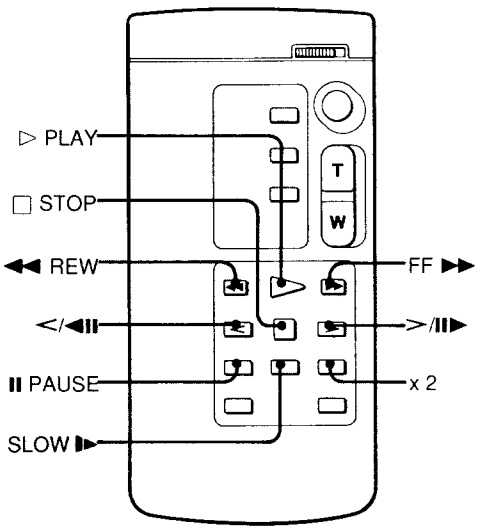
To stop playback, press □.
To rewind the tape, press ◀◀.
To advance the tape rapidly, press ▶▶.

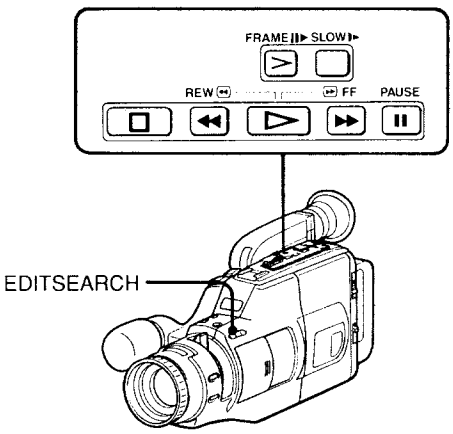
To make the same indications in the viewfinder appear on the TV
Press DATA SCREEN.
To clear the indications, press DATA SCREEN again.

After playing back
Set the POWER switch on the camcorder and CHARGE/VTR selector on the AC power adaptor to OFF.

Notes
- When the still picture lasts for 5 minutes or more, the camcorder automatically enters the stop mode.
- Streaks appear in the still picture. They are wider when playing back an LP-recorded tape.

(S-2)





Various Playback Modes

(S-2)

To view the still picture (playback pause)
Press PAUSE II during playback.
II appears in the viewfinder.
To resume normal playback, press ▷ or II.

To change the playback direction
Press < /◀II for the reverse or > /II▶ for the forward direction during playback. >on the camcorder is only for the forward direction.
-x1 or x1 appears in the viewfinder.

To view the picture at 1/5 speed (slow playback)
Select the playback direction with < /◀II or > /II▶, and then press I▶ SLOW during playback. SLOW I▶ on the camcorder is only for the forward direction.
◀I or I▶ appears in the viewfinder.
When slow playback lasts for 1 minute or more, the forward or reverse playback at the normal speed starts automatically, depending on the tape direction.
To resume normal playback, press ▷.

To view the picture at double speed*
Select the playback direction with < /◀II or > /II▶, and then press x2 on the Commander. -x2 or x2 appears in the viewfinder.
To resume normal playback, press ▷.

To view the picture frame-by-frame
In the still picture mode, press < /◀II or > /II▶. Each time you press, the picture appears by a frame.
II▶ on the camcorder is only for the forward direction. ◀II or II▶ appears in the viewfinder.
If you keep pressing ◀II/II▶, playback at 1/30 speed starts.
To resume normal playback, press ▷.

To locate the desired scene
Keep pressing ◀◀ or ▶▶ during playback or in the still picture mode. ⏪ or ⏩ appears in the viewfinder. **To resume normal playback,** release the button.

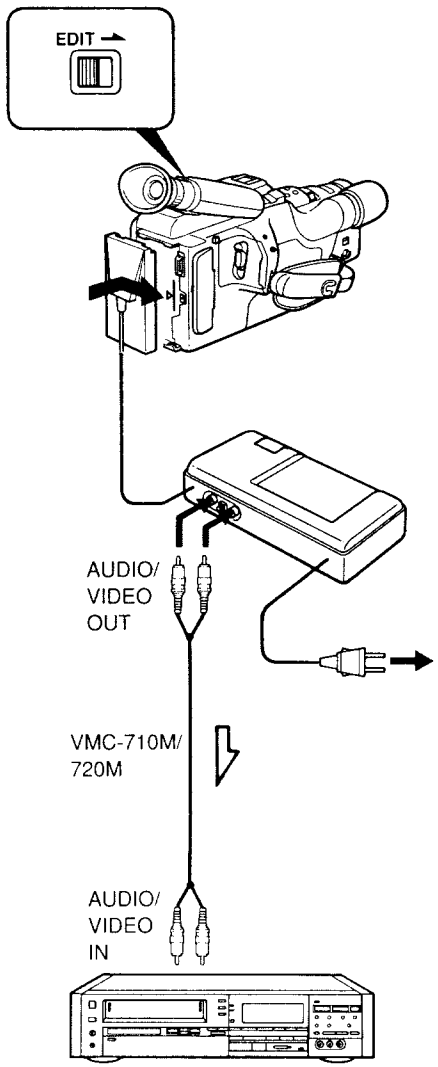
To locate the desired scene quickly
Press ◀◀ during rewinding or ▶▶ during advancing the tape rapidly. ⏪ or ⏩ appears in the viewfinder.
To resume normal playback, press ▷.

* Only on the Commander.

About the playback sound
In the various playback modes, streaks appear and the sound can be heard during playback at double speed in forward direction, but is little noisy.

If the still picture, frame-by-frame picture, or slow playback picture is noisy
Set the camcorder in slow playback mode, and press the + or – side of EDITSEARCH until the least noisy picture appears.

(T)



Editing onto Another VCR

You can create your own video program by editing with any other 8-mm, Betamax, or VHS format VCR. Also you can superimpose and record a title.

Before You Begin

(T)

- Make connections using the supplied AC power adaptor and a commercially available audio/video cable (like Sony VMC-710M/720M for monaural equipment, or VMC-910MS/920MS for stereo equipment).
- Set the input selector of the VCR to LINE, if available.
- Set EDIT on the camcorder to the direction of the arrow.

Operation

1 Insert a tape for recording into the recording VCR.

2 Set POWER of the camcorder to VTR and insert the recorded tape.

3 Playback the tape on the camcorder and locate the point where you want to start editing and set the camcorder to the playback pause mode.

4 On the recording VCR, locate the recording start point and set the VCR to the recording pause mode.

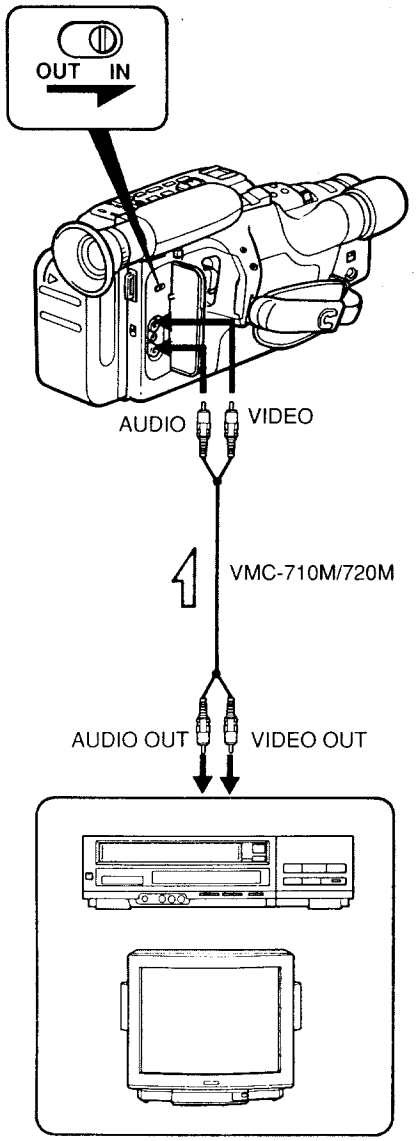
5 Press II of both units simultaneously to start editing.

To stop editing momentarily, press **II** on the recording VCR.
To edit more scenes, repeat steps 3 to 5.
To stop editing, press □ on both units.

To record a title
You can superimpose and record a title on the picture while editing.
For details, refer to page 39 to 42.

If you use the DATA SCREEN function
The indications displayed on the TV screen will also be recorded.

(U)



Recording from a TV or Another VCR

You can record a TV program from the TV or a tape from another VCR equipped with audio/video outputs.

Before You Begin

(U)

- **Set the IN/OUT selector on the camcorder to IN.**
- Make connections using a commercially available audio/video cable (like Sony VMC-710M/720M for monaural equipment, or VMC-910MS/920MS for stereo equipment).
- **Disconnect the RFU adaptor from the AC power adaptor,** if it is connected.
  When disconnecting, turn off the power of the adaptor. (OFF)

Operation

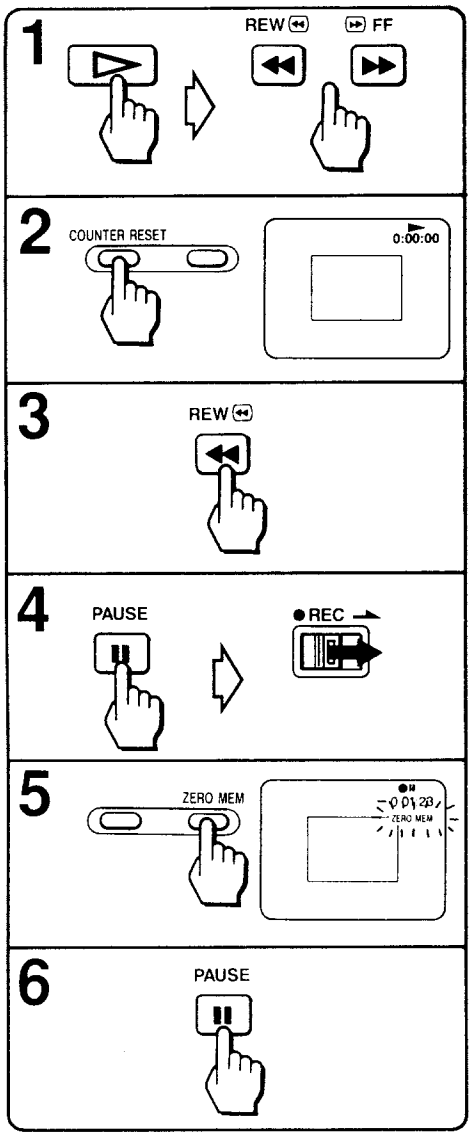
1 **Turn on the TV or VCR.**

2 **Select the TV channel or play back the tape to be recorded.**

3 **Set the POWER of the camcorder to VTR.**

4 **Insert a tape and slide ● REC.**
Recording will start.
You can monitor the picture being recorded in the viewfinder screen.

(V)



Insert Recording

You can insert a new scene from a VCR or the TV onto your originally recorded tape. **(V)**

Before You Begin

- Connection is the same as in "Recording from a TV or Another VCR".
- Set the VCR in the playback pause mode at the beginning of the scene to be recorded.
- Set the POWER of the camcorder to VTR and display the counter in the viewfinder.

Operation

1 Locate the end point where the insert should end by pressing ◀◀ or ▶▶ during playback.

2 At the end point, press COUNTER RESET.
The counter is reset to "0:00:00".

3 Locate the start point where the insert should begin.

4 At the start point, set the camcorder into recording pause mode.

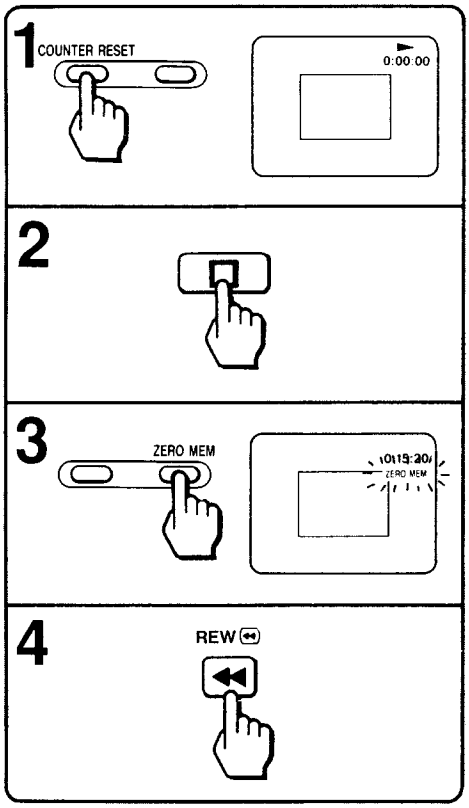
5 Press ZERO MEM.
The end point of the insert is stored in memory.

6 Press II of both units to start insert recording.
You can monitor the picture being inserted in the viewfinder screen.

The insert recording will stop automatically near the zero point on the counter.

To change the end point
Press ZERO MEM so that the ZERO MEM indicator disappears, and operate again from step 1.

(W)



Using the Tape Counter

During recording or playback, the digits on the counter indicate the recording or playback time.

To Index the Whole Tape

Press COUNTER RESET at the beginning of the tape so that the counter shows "0:00:00". Write down the counter reading at a particular point so that you can easily find that point later by referring to the tape counter.

To Return to a Pre-Registered Point

(W)

1 During playback, press COUNTER RESET at the point you want to locate later.

2 Press □ when the playback is finished, as usual.

3 Press ZERO MEM.
The "ZERO MEM" indication blinks in the viewfinder.

4 Press ◀◀ or ▶▶.
The tape rewinds or advances and stops automatically when the counter reaches approximately "0:00:00".

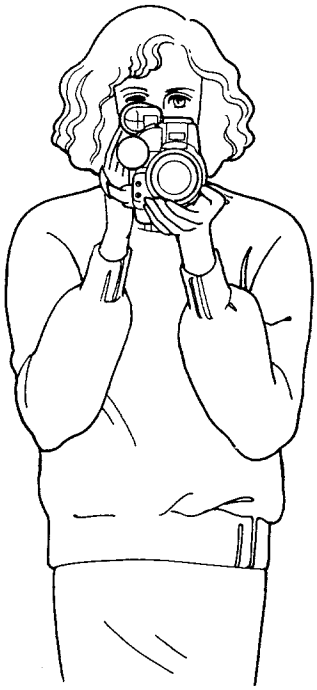
Notes on the tape counter and ZERO MEM button

- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide. There will be a time lag of several seconds especially when you repeat fast-forward running/rewinding or when you play back a tape recorded in both LP and SP modes mixed.
- Be sure to press ZERO MEM after you stop the tape. It does not function during playback.
- The ZERO MEM mode is canceled automatically once the tape is rewound or sent forward to the point where you pre-registered.

Hints for Better Shooting

Shooting Stable Pictures

(X-1)



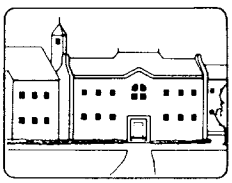
Assume a good posture for shooting (X-1)
For hand-held shots, it is important to hold the camcorder properly.

- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the camcorder with your thumb.
- Place you right elbow against your side.
- Place your left hand under the camcorder to support it. When adjusting the focus manually, make sure the camcorder does not move.
- Place your eye firmly against the viewfinder eyecup.

Use a tripod
If you have a tripod for a still camera, it can also be used with the camcorder. If a tripod is not available, try placing the camcorder on a table top or any other flat surface of suitable height.

Keep the horizontal plane level (X-2)
The horizontal plane can be easily determined by using the viewfinder frame as a reference.

(X-2)



Planning Beforehand

If you are going to edit the tape after recording
Shoot the scene a little longer to make the editing easier.

If you are not going to edit the tape after recording
First record a title and then use the START/STOP button to make a smooth recording.

Hints for Better Shooting

Lighting

Shoot with the sun behind you

When the light source is behind the subject, or in the following situations, the subject will be recorded too dark and the background too light.

- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background. In this case, the face will be recorded too dark.

Use video lights in the dark

To get the best colors, a sufficient light level must be maintained. Photography lamps or halogen lamps are recommended. For best results, use of Sony video lights are recommended since their weight and low heat output levels allow safe, direct connection to the camcorder.

Do not point the light at the camcorder. The high heat from the light can warp the casing of the camcorder.

And do not place your face or hair too close to the light during low-position shooting (page 23).

For detailed instructions on proper use of the light, read its instruction manual.

Brightness levels

Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording technique.

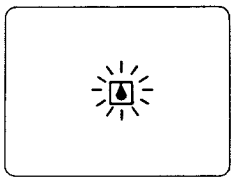
	Unit: lux	ND filter required
Snow-covered mountains Snow fields Sandy beach, clear day in summer		
Clear day, mid-day (100,000 lux)	100,000	
Clear day, mid-afternoon (35,000) Overcast day, mid-day (32,000)		
	10,000	
Overcast day, one hour after sunrise (2,000)		Normal recording
Office lit by fluorescent lamps, near window (1,000)	1,000	
Clear day, one hour before sunset (1,000) Department store counter (500–700)		
Station wicket (650)	500	
Office lit by fluorescent lamps (400–500) Room lit by two 30 W fluorescent lamps (300)	300	
Subway station platform (300) Arcade at night (150–200)	200	
	100	
Theater lobby (15–35) Candle light (10–15)		Video light recommended
	10	

Notes and Precautions

Notes on Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

(Y-1)



If moisture condenses inside the unit

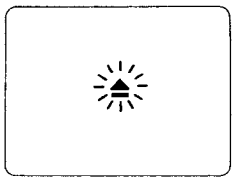
(Y-1)

Moisture is present inside the camcorder when the 💧 indication in the viewfinder blinks. In this case, no function except for tape ejection will work.

Eject the tape, turn off the camcorder, and leave it with the cassette holder open for at least 1 hour.

The camcorder can be used again if the 💧 indication does not appear when the power is turned on again.

(Y-2)



If moisture condenses on the surface of the tape

(Y-2)

If moisture is present on the surface of the tape when the tape is inserted and a tape transport button (▷, ◀◀, etc.) is pressed, the ⏏ indication blinks inside the viewfinder.

In such case, no function except for tape ejection will work.

Eject the tape and let it sit for at least 1 hour.

The tape can be used again if the ⏏ indication does not appear when the tape is inserted and a tape transport button is pressed.

If moisture condenses on the lens

No caution indications will appear, but the picture becomes dim.

Turn off the power and leave the camcorder unused for at least 1 hour.

Notes and Precautions

(Y-3)

Notes on Video Head Cleaning

To ensure clear picture, clean the video heads periodically.

When playback pictures are noisy or hardly visible, the video heads may be contaminated.

(Y-3)

[a] Slight contamination

[b] Critical contamination

In such cases,

1 Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied), referring to its instructions.
2 After cleaning, check if the picture is clear by recording or playing back with an ordinary tape.
3 If the picture is still noisy, repeat cleaning. (Do not repeat cleaning more than 5 times.)

Caution

Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note

If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

Notes and Precautions

Precautions

On operation

- Operate the camcorder on 6.0 V (battery pack), 7.5 V (AC power adaptor), or 9.0 V (alkaline batteries).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Do not hold the camcorder by the viewfinder or the microphone.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the lens cap on the lens when not using the camera.
- Do not wrap the camcorder and operate it because heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- Do not put the camcorder on the sand.

On care

- When the unit will not be used for a long time, disconnect the power source and remove the tape. Periodically turn on the power, operate the camera section and player section, and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, wipe them off with a soft cloth.
  Clean the camcorder body with a dry, soft cloth. or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Note on copyright

Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

Using your Camcorder Abroad

Each country has its own electricity system and TV color system. Before using your camcorder abroad, check the following points.

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60Hz.

Difference in Color Systems

You can view the playback picture in the viewfinder. However, if you want to view the playback picture on a TV, it must be a NTSC system-based TV. Check the following list. (in alphabetical order)

NTSC system countries

Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, The Philippines, U.S.A., Venezuela, etc.

PAL system countries

Argentina, Australia, Austria, Belgium, Brazil, China, Denmark, Finland, Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Paraguay, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, Urguay, West Germany, etc.

SECAM system countries

Bulgaria, France, Guiana, Hungary, Iran, Iraq, Monaco, Poland, Soviet Union, etc.

Specifications

System

Video recording system
Rotary two-head, Helical scanning FM system
Audio recording system
Rotary head, FM system
Video signal: NTSC color, EIA standards
Usable cassette: 8 mm video format cassette
Tape speed: SP mode: Approx. 1.43 cm (1/16 inch)/sec
LP mode: Approx. 0.72 cm (1/32 inch)/sec (playback only)
Recording time: SP mode: 2 hours (P6-120)
Playback time: SP mode: 2 hours (P6-120)
LP mode: 4 hours (P6-120)
Fast-forward/rewind time
Approx. 6.5 min. (P6-120)
Image device: CCD (Charge Coupled Device)
Viewfinder: Electronic viewfinder (black and white)
Lens: Combined 8 × power zoom lens f=8.5 to 68 mm (11/32 to 2 3/4 inches), F1.6 with macro Filter diameter: 46 mm (1 13/16 inches)
Auto focus system: TTL
Color temperature: Automatic, HOLD, ☼ (indoor) 3,200K, • (outdoor) 5,800K
Minimum illumination
2 lux
Illumination range: 2 lux to 100,000 lux (0.2 to 9294 footcandles)
Recommended illumination
More than 100 lux (9 footcandles)
Aperture correction: Automatic back light adjustment

Input and output connector

Video input/output*: Phono jack, 1 Vp-p. 75 ohms unbalanced sync negative
Audio input/output*: Phono jack,
Input: –7.5 dBs, input impedance more than 47 kilohms
Output: –7.5 dBs, at output impedance less than 1 kilohms
RFU DC OUT: Special minijack, 5 V DC
Earphone jack: Minijack, 8-ohm impedance
Remote jack: Stereo mini-minijack
MIC jack: Minijack, –66 dBs, low impedance
With 2.5 to 3 V DC output, impedance 6.8 kilohms
Microphone power output jack
Special minijack, 5 V DC

* Video/audio input and output is switched with the IN/OUT selector.

General

Power requirements
On battery mounting surface
6.0 V (battery pack)
7.5 V (AC power adaptor)
9.0 V (alkaline batteries)
Power consumption
6.2 W (camera recording) including the viewfinder
Installation: Vertically, horizontally
Operating temperature
0°C to 40°C (32°F to 104°F)
Storage temperature
–20°C to +60°C (–4°F to +140°F)
Dimensions: Approx. 111 × 139 × 321 mm (w/h/d) (4 3/8 × 5 1/2 × 12 3/4 inches) including the lens hood
Weight: Approx. 1.1 kg (2 lb 3 oz) excluding the battery and cassette
Microphone: Electret condenser microphone, omni-directional monaural type
Supplied accessories
See page 4.

Wireless Remote Commander

Remote control system
Infrared control
Command mode: VTR 2
Power requirements
3 V DC, 2 size AA batteries
Dimensions: Approx. 57 × 20 × 120 mm (w/h/d) (2 1/4 × 13/16 × 4 3/4 inches)
Weight: Approx. 62 g (2 oz) (excluding batteries)

Design and specifications are subject to change without notice.

Trouble Check

If any difficulty should arise during operation, go through the following table. Should the difficulty persist, unplug the unit and contact your Sony dealer or local authorized Sony facility.

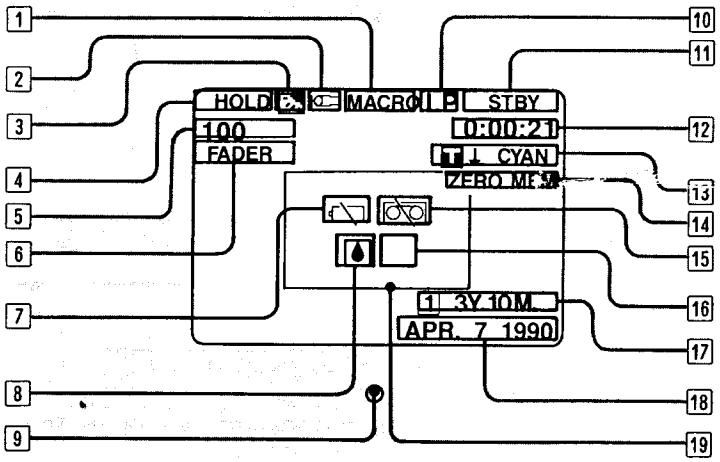
	Symptom	Indication in the viewfinder	Cause and corrective actions
During camera recording/editing	The START/STOP button does not operate.	—	• The POWER switch is not set to CAMERA. • The tape is affixed to the drum. Remove the tape with the cassette eject button. (page 20)
		⏏, ⏏, battery lamp fast blinking	• The tape is at its end.
		⏏, ⏏ slow blinking	• The tab on the tape is out (red). (page 20)
		⏏, slow blinking	• No cassette ➡ Insert a cassette.
	—	⏏, battery lamp slow blinking	• The tape is near its end.
		⊗ blinking	• The video heads may be contaminated. Clean the heads using the Sony V8-25CLH cleaning cassette. (page 59)
	The power turns off automatically.	—	• The camcorder has been in the recording pause mode for more than 5 minutes. (page 23)
	The image on the viewfinder screen is not clear.	—	• The viewfinder lens is not adjusted. (page 21)
	The autofocusing function does not work.	—	• The AUTO LOCK cover is not closed completely. (page 28) • Shooting conditions are not suitable for autofocusing operation. Adjust the focus manually. (page 29)
	The date/time indication blinks blinks for 5 seconds in the viewfinder after setting POWER to CAMERA.	"AM 12:00:00" blinks	• The lithium battery is not installed. • The lithium battery is exhausted. ➡ Install a new lithium battery.
		The current time indication blinks.	• The lithium battery is weak. ➡ Install a new lithium battery.
During playback	The tape does not move when a tape transport button is pressed.	—	• The POWER switch is not set to VTR.
	A vertical band appears when a subject such as lights or a candle frame is shot against a dark background.	—	• The contrast between the subject and background is too high; the camera is not malfunctioning.
	The color of the playback is not appropriate.	—	• The AUTO LOCK cover is not closed completely. (page 28) • Shooting conditions are not suitable for auto white balance operation. Adjust the white balance manually. (page 31)
	The playback picture is not clear.	—	• The channel or input for the camcorder is not selected on the TV. (page 49) • The EDIT switch is set in the direction of the arrow. (page 52)
		⊗ blinking	• The video heads may be contaminated. Clean the heads using the Sony V8-25CLH cleaning cassette. (page 59)

Others

Symptom	Indication in the viewfinder	Cause and corrective actions
When both the VIDEO•AUDIO jacks and the AC power adaptor are used to connect signals, the picture on the TV is not clear or moves vertically.	—	• The IN/OUT selector is set to OUT. ➡ Set it to IN.
The power turns off or does not turn on.	battery lamp fast blinking	• The battery is used up. ➡ Attach a charged battery.
	battery lamp slow blinking	• The battery is weak. ➡ Attach a charged battery.
	—	• The battery is not attached. ➡ Attach a charged battery.
	—	• The AC power adaptor is not connected to a wall outlet. • The CHARGE/VTR selector on the AC power adaptor is not set to VTR (DC OUT).
The battery pack is quickly discharged.	battery lamp blinking	• The ambient temperature is too low. • The battery pack has not been charged fully. • The capacity of the battery pack itself is shortened. (page 17)
The tape cannot be removed from the compartment.	battery lamp blinking	• The power is not supplied to the camcorder. • The battery is used up.
No function except for tape ejection works.	⏏ blinking	• Moisture condensation has occurred. (page 58)
	⏏ blinking	• Other trouble may have occurred. Consult your nearest Sony dealer.

Indications Inside the Viewfinder

(Z)



(Z)

1 Auto-focusing in macro range
2 BUILT-IN MIC SELECT is set to WIND.
3 BACK LIGHT is pressed.
4 White balance mode (☀/☼/HOLD)
5 Shutter speed
6 FADER is pressed.
7 "Exchange battery."
8 Moisture has condensed.
9 Shows up during recording.
When blinking: "Exchange battery."
10 Playback mode (LP)
11 Tape transport mode
12 Tape counter
13 Title mode
14 ZERO MEM is pressed.
15 "Exchange tape."
16 "Clean video heads."/"Trouble occurred." (⊗, ⏏)
17 Age or anniversary
18 Date or time
19 Auto focus adjusting range
Goes out during manual focusing

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